PATENT
Docket No. 134.01930101

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appellant(s):	SPARER et al.	Group Art Unit:	1618
Serial No.:	10/640,853	Examiner:	James W. Rogers
Confirmation No.:	9178		
Filed:	August 13, 2003		

For: ACTIVE AGENT DELIVERY SYSTEMS, MEDICAL DEVICES, AND METHODS

APPEAL BRIEF

Commissioner for Patents
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Sir:

This Brief is presented in support of the Appeal filed under 37 C.F.R. §§1.113 and 1.191 on January 29, 2008 from the decision dated November 5, 2007 rejecting claims 1-18 and 20-78, of the above identified application. The decision dated November 5, 2007 reaffirms the final rejection of claims 1-18 and 20-78 issued April 11, 2007.

This Brief is being submitted as set forth in 37 C.F.R. §41.37. Please charge Deposit Account No. 13-4895 the fee for filing this Brief under 37 C.F.R. §41.20(b)(2).

I. REAL PARTY IN INTEREST

The real party in interest of the above-identified patent application is the assignee, Medtronic, Inc., evidenced by the assignment of the application from the inventors to Medtronic, Inc., recorded August 13, 2003, at Reel 014508, Frame 0287.

II. RELATED APPEALS AND INTERFERENCES

Related applications are currently under appeal with the Board of Patent Appeals and Interferences that may directly affect, be directly affected by, or have a bearing on the Board's decision in the pending appeal. The related applications are U.S. Patent Application Serial No. 10/640,714; and U.S. Patent Application Serial No. 10/640,702.

III. STATUS OF CLAIMS

Claims 1-18 and 20-78 are pending and are the subject of this Appeal (see Claims Appendix.

Claims 1-18 and 20-78 stand rejected under 35 U.S.C. §102(b) as being anticipated by Hossainy *et al.* (U.S. Patent No. 6,153,252).

Claims 1-18 and 20-78 stand rejected under 35 U.S.C. §102(b) as being anticipated by Whitbourne *et al.* (U.S. Patent No. 6,110,483).

Claims 1-18 and 20-78 stand rejected under 35 U.S.C. §102(e) as being anticipated by Sirhan *et al.* (U.S. Patent Application Publication No. US 2002/0082679 A1).

Claims 1-18 and 20-78 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Hossainy *et al.* (U.S. Patent No. 6,153,252).

Claims 1-18 and 20-78 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Whitbourne *et al.* (U.S. Patent No. 6,110,483).

Claims 1-18 and 20-78 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Sirhan *et al.* (U.S. Patent Application Publication No. US 2002/0082679 A1).

Claim 19 is canceled.

IV. STATUS OF AMENDMENTS

No claim amendments have been filed subsequent to the rejection of claims 1-18 and 20-78 in the Non-Final Office Action dated November 5, 2007, which reaffirmed final rejection of claims 1-18 and 20-78 in the Final Office Action dated April 11, 2007. Claims 46 and 71 were amended on September 14, 2007. The amendments have been entered (Non-Final Office Action, November 5, 2007). Accordingly, the Claims Appendix reflects entry of the amendments.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Independent Claim 1

Claim 1 is directed to a method of forming a tunable active agent delivery system having a target diffusivity. The method includes:

providing a hydrophobic active agent having a solubility parameter and a molecular weight of no greater than about 1200 g/mol; and

combining the hydrophobic active agent with a miscible polymer blend that is capable of controlling delivery of the active agent and comprises:

a first miscible polymer having a solubility parameter, and

a second polymer selected to be miscible with the first polymer and having a solubility parameter, wherein:

the difference between the solubility parameter of the active agent and at least one solubility parameter of at least one of the polymers is no greater than about 10 $J^{1/2}/cm^{3/2}$, and the difference between at least one solubility parameter of each of the polymers is no greater than about 5 $J^{1/2}/cm^{3/2}$;

at least one polymer has an active agent diffusivity higher than the target diffusivity and at least one polymer has an active agent diffusivity lower than the target diffusivity;

the molar average solubility parameter of the blend is no greater than 25 $J^{1/2}/cm^{3/2}$; and

the swellability of the blend is no greater than 10% by volume;

and further wherein:

the miscible polymer blend comprises at least one hydrophobic cellulose derivative and at least one miscible polyvinyl homopolymer or copolymer selected from the group consisting of a polyvinyl alkylate homopolymer or copolymer, a polyvinyl alkyl ether homopolymer or copolymer, a polyvinyl acetal homopolymer or copolymer, and combinations thereof; or

the miscible polymer blend comprises a polyurethane and a second miscible polymer that is not a hydrophobic cellulose ester; wherein the second miscible polymer is selected from the group consisting of a polycarbonate, a polysulfone, a polyurethane, a polyphenylene oxide, a polyimide, a polyamide, a polyester, a polyether, a polyketone, a polyepoxide, a styrene-acrylonitrile copolymer, a poly(vinyl ester), a poly(vinyl ether), a polyacrylate, a poly(methyl acrylate), a polymethacrylate, a poly(methyl methacrylate), and combinations thereof; or

the miscible polymer blend comprises a poly(ethylene-co-(meth)acrylate) and a second miscible polymer not including poly(ethylene vinyl acetate); wherein the second miscible polymer is selected from the group consisting of a poly(vinyl alkylate) homopolymer or copolymer, a poly(vinyl alkyl ether) homopolymer or copolymer, a poly(vinyl acetal) homopolymer or copolymer, a poly(alkyl and/or aryl methacrylate) homopolymer or copolymer, a poly(alkyl and/or aryl acrylate) homopolymer or copolymer, and combinations thereof.

Providing a hydrophobic active agent having a solubility parameter and a molecular weight of no greater than about 1200 g/mol is described at, for example, from page 16, line 3 through page 19, line 21.

Combining the active agent with a miscible polymer blend that is capable of controlling delivery of the active agent is described at, for example, page 12, lines 14-17.

Selecting the polymers of the miscible polymer blend based on their miscibility is described at, for example, from page 18, line 18 through page 19, line 5.

Suitable active agent diffusivities of the polymers are described at, for example, page 27, lines 21-28.

Suitable molar average solubility values and swellability values are described at, for example, page 31, lines 13-18.

Suitable polymer combinations are described at, for example, from page 29, line 30 through page 30, line 24.

Independent Claim 10

Claim 10 is directed to a method of forming a tunable active agent delivery system having a target diffusivity. The method includes:

providing a hydrophilic active agent having a solubility parameter and a molecular weight of no greater than about 1200 g/mol; and

combining the hydrophilic active agent with a miscible polymer blend that is capable of controlling delivery of the active agent, and comprises:

a first miscible polymer having a solubility parameter, and

a second polymer selected to be miscible with the first polymer and having a solubility parameter, wherein:

the difference between the solubility parameter of the active agent and at least one solubility parameter of at least one of the polymers is no greater than about 10 $J^{1/2}/cm^{3/2}$, and the difference between at least one solubility parameter of each of at least two polymers is no greater than about 5 $J^{1/2}/cm^{3/2}$;

at least one polymer has an active agent diffusivity higher than the target diffusivity and at least one polymer has an active agent diffusivity lower than the target diffusivity;

the molar average solubility parameter of the blend is greater than 25 $J^{1/2}/cm^{3/2}$;

and

the swellability of the blend is no greater than 10% by volume;

and further wherein:

the miscible polymer blend comprises miscible polymers selected from the group consisting of polyacrylonitriles, cyanoacrylates, methacrylonitriles, hydrophilic cellulosics, and combinations thereof; or

the miscible polymer blend comprises a polyurethane and at least one miscible hydrophilic polymer selected from the group consisting of a polyurethane, a polyvinyl alcohol, a poly(alkylene ether), a polyvinyl pyridine, a polyvinyl pyrrolidone, a polyacrylonitrile, a polyacrylamide, a polyvinyl pyrrolidone/polyvinyl acetate copolymer, a sulfonated polystyrene, a polyvinyl pyrrolidone/polystyrene copolymer, a polysaccharide, a xanthan, a hydrophilic cellulose derivative, a hyaluronic acid, a hydrophilic polyacrylate, a hydrophilic polymethacrylate, a DNA or analog thereof, an RNA or analog thereof, heparin, a chitosan, a polyethylene imine, a polyacrylamide, an amine-containing polymer, and combinations thereof; or

the miscible polymer blend comprises two hydrophobic polyurethanes as a cap coat in a reservoir system.

Providing a hydrophilic active agent having a solubility parameter and a molecular weight of no greater than about 1200 g/mol is described at, for example, from page 16, line 3 through page 19, line 21.

Combining the active agent with a miscible polymer blend that is capable of controlling delivery of the active agent is described at, for example, page 12, lines 14-17.

Selecting the polymers of the miscible polymer blend based on their miscibility is described at, for example, from page 18, line 18 through page 19, line 5.

Suitable active agent diffusivities of the polymers are described at, for example, page 27, lines 21-28.

Suitable molar average solubility values and swellability values are described at, for example, page 30, lines 25-30.

Suitable polymers are described at, for example, from page 30, line 3 through page 31, line 12 and from page 58, line 22 through page 61, line 24.

Independent Claim 20

Claim 20 is directed to a method of forming a tunable active agent delivery system having a target diffusivity. The method includes:

providing a hydrophobic active agent having a solubility parameter and a molecular weight of greater than about 1200 g/mol; and

combining the hydrophobic active agent with a miscible polymer blend that is capable of controlling delivery of the active agent and comprises:

a first miscible polymer having a solubility parameter, and

a second polymer selected to be miscible with the first polymer and having a solubility parameter, wherein:

the difference between the solubility parameter of the active agent and at least one solubility parameter of at least one of the polymers is no greater than about 10 $J^{1/2}/cm^{3/2}$, and the difference between at least one solubility parameter of each of at least two polymers is no greater than about 5 $J^{1/2}/cm^{3/2}$;

at least one polymer has an active agent diffusivity higher than the target diffusivity and at least one polymer has an active agent diffusivity lower than the target diffusivity;

the molar average solubility parameter of the blend is no greater than 25 $J^{1/2}/cm^{3/2}$; and

the swellability of the blend is greater than 10% by volume;

and further wherein:

> the miscible polymer blend comprises at least one hydrophobic cellulose derivative and at least one miscible polymer selected from the group consisting of polyethylene, polypropylene, polyisobutylene, polystyrene, poly(vinyl chloride), poly(vinyl bromide), poly(vinylidene chloride), poly(tetrafluoroethylene), poly(chloro trifluoroethylene), poly(vinyl alcohol), poly(vinyl acetate), poly(vinyl propionate), poly(methyl acylate), poly(ethyl acrylate), poly(propyl acrylate), poly(butyl acrylate), poly(isobutyl acrylate), poly(2,2,3,3,4,4,4-heptafluorobutyl acrylate), poly(methyl methacrylate), poly(ethyl methacrylate), poly(butyl methacrylate), poly(isobutyl methacrylate), poly(tert-butyl methacrylate), poly(benzyl methacrylate), poly(ethoxyethyl methacrylate), polyacrylonitrile, polymethacrylonitrile, poly(alpha-cyanomethyl acrylate), polybutadiene, polyisoprene, polychloroprene, polyformaldehyde, poly(tetramethylene oxide), poly(propylene oxide), polyepichlorohydrin, poly(ethylene sulphide), poly(styrene sulphide), poly(ethylene terephthalate), poly(8-aminocaprylic acid), poly(hexamethylene adipamide), polyurethane hard segment (MDI + BDO), poly(bisphenyl A carbonate), cellulose acetate butyrate, phenoxy, poly(vinyl pyrrolidone), poly(vinyl pyrrolidone)-co-poly(vinyl acetate), poly(ethylene oxide), and combinations thereof.

Providing a hydrophobic active agent having a solubility parameter and a molecular weight of no greater than about 1200 g/mol is described at, for example, from page 16, line 3 through page 19, line 21.

Combining the active agent with a miscible polymer blend that is capable of controlling delivery of the active agent is described at, for example, page 12, lines 14-17.

Selecting the polymers of the miscible polymer blend based on their miscibility is described at, for example, from page 18, line 18 through page 19, line 5.

Suitable active agent diffusivities of the polymers are described at, for example, page 27, lines 21-28.

Suitable molar average solubility values and swellability values are described at, for example, page 31, lines 13-18.

Suitable polymers are described at, for example, page 30, lines 3-9 and from page 31, line 19 through page 32, line 4.

Independent Claim 32

Claim 32 is directed to a method of forming a tunable active agent delivery system having a target diffusivity. The method includes:

providing a hydrophilic active agent having a solubility parameter and a molecular weight of greater than about 1200 g/mol; and

combining the hydrophilic active agent with a miscible polymer blend that is capable of controlling delivery of the active agent, and comprises:

a first miscible polymer having a solubility parameter, and

a second polymer selected to be miscible with the first polymer and having a solubility parameter, wherein:

the difference between the solubility parameter of the active agent and at least one solubility parameter of at least one of the polymers is no greater than about 10 $J^{1/2}/cm^{3/2}$, and the difference between at least one solubility parameter of each of at least two polymers is no greater than about 5 $J^{1/2}/cm^{3/2}$;

at least one polymer has an active agent diffusivity higher than the target diffusivity and at least one polymer has an active agent diffusivity lower than the target diffusivity;

the molar average solubility parameter of the blend is greater than 25 $J^{1/2}/cm^{3/2}$; and

the swellability of the blend is greater than 10% by volume;

and further wherein:

the miscible polymer blend comprises at least one hydrophilic polymer and a second miscible polymer that is hydrophilic or hydrophobic; wherein the hydrophilic polymer is selected from the group consisting of a polyurethane, a polyvinyl alcohol, a poly(alkylene ether), a polyvinyl pyridine, a polyvinyl pyrrolidone, a polyacrylonitrile, a polyacrylamide, a polyvinyl pyrrolidone/polyvinyl acetate copolymer, a sulfonated polystyrene, a polyvinyl pyrrolidone/polystyrene copolymer, a polysaccharide, a xanthan, a hydrophilic cellulose derivative, a hyaluronic acid, a hydrophilic polyacrylate, a hydrophilic polymethacrylate, a DNA or analog thereof, an RNA or analog thereof, heparin, a chitosan, a polyethylene imine, a polyacrylamide, an amine-containing polymer, and combinations thereof; and the hydrophobic polymer is selected from the group consisting of a polyurethane, a polycarbonate, a polysulfone, a polyphenylene osied, a polyimide, a polyamide, a polyester, a polyether, a polyketone, a polyepoxide, a styrene-acrylonitrile copolymer, a polyvinyl alkylate, a polyvinyl alkyl ether, a polyvinyl acetal, a hydrophobic cellulose derivative, and combinations thereof.

Providing a hydrophilic active agent having a solubility parameter and a molecular weight of no greater than about 1200 g/mol is described at, for example, from page 16, line 3 through page 19, line 21.

Combining the active agent with a miscible polymer blend that is capable of controlling delivery of the active agent is described at, for example, page 12, lines 14-17.

Selecting the polymers of the miscible polymer blend based on their miscibility is described at, for example, from page 18, line 18 through page 19, line 5.

Suitable active agent diffusivities of the polymers are described at, for example, page 27, lines 21-28.

Suitable molar average solubility values and swellability values are described at, for example, page 32, lines 5-10.

Suitable polymers are described at, for example, page 32, lines 11-23.

Independent Claim 44

Claim 44 is directed to a method of making a medical device. The method includes:

providing a medical device comprising a surface; and

adhering an active agent delivery system formed by the method of claim 1 to at least a portion of the surface.

Medical devices are described at, for example, from page 33, line 25 through page 34, line 17.

Forming the active agent delivery system is described at, for example, from page 16, line 3 through page 19, line 21; page 12, lines 14-17; page 18, line 18 through page 19, line 5; page 27, lines 21-28; page 31, lines 13-18; and from page 29, line 30 through page 30, line 24.

Adhering an active agent delivery system to a portion of the medical device surface is described at, for example, page 35, lines 3-25.

Independent Claim 46

Claim 46 is directed to a method of making a medical device. The method includes:

providing a medical device comprising a surface; and

adhering an active agent delivery system formed by the method of claim 10 to at least a portion of the surface.

Medical devices are described at, for example, from page 33, line 25 through page 34, line 17.

Forming the active agent delivery system is described at, for example, from page 16, line 3 through page 19, line 21; page 12, lines 14-17; from page 18, line 18 through page 19, line 5; page 27, lines 21-28; page 30, lines 25-30; from page 30, line 3 through page 31, line 12 and from page 58, line 22 through page 61, line 24.

Adhering an active agent delivery system to a portion of the medical device surface is described at, for example, page 35, lines 3-25.

Independent Claim 48

Claim 48 is directed to a method of making a medical device. The method includes:

providing a medical device comprising a surface; and

adhering an active agent delivery system formed by the method of claim 20 to at least a portion of the surface.

Medical devices are described at, for example, from page 33, line 25 through page 34, line 17.

Forming the active agent delivery system is described at, for example, from page 16, line 3 through page 19, line 21; page 12, lines 14-17; from page 18, line 18 through page 19, line 5; page 27, lines 21-28; page 31, lines 13-18; page 30, lines 3-9; and from page 31, line 19 through page 32, line 4.

Adhering an active agent delivery system to a portion of the medical device surface is described at, for example, page 35, lines 3-25.

Independent Claim 50

Claim 50 is directed to a method of making a medical device. The method includes:

providing a medical device comprising a surface; and

adhering an active agent delivery system formed by the method of claim 32 to at least a portion of the surface.

Medical devices are described at, for example, from page 33, line 25 through page 34, line 17.

Forming the active agent delivery system is described at, for example, from page 16, line 3 through page 19, line 21; page 12, lines 14-17; from page 18, line 18 through page 19, line 5; page 27, lines 21-28; page 32, lines 5-10; and page 32, lines 11-23.

Adhering an active agent delivery system to a portion of the medical device surface is described at, for example, page 35, lines 3-25.

Independent Claim 52

Claim 52 is directed to a method of making a stent. The method includes:

providing a stent comprising a surface; and

adhering an active agent delivery system formed by the method of claim 1 to at least a portion of the surface.

Stents are described at, for example, page 34, lines 3-8 and 12-16, and page 35, lines 26-33.

Forming the active agent delivery system is described at, for example, from page 16, line 3 through page 19, line 21; page 12, lines 14-17; page 18, line 18 through page 19, line 5; page 27, lines 21-28; page 31, lines 13-18; and from page 29, line 30 through page 30, line 24.

Adhering an active agent delivery system to a portion of the stent surface is described at, for example, page 35, lines 3-25.

Independent Claim 53

Claim 53 is directed to a method of making a stent. The method includes:

providing a stent comprising a surface; and

adhering an active agent delivery system formed by the method of claim 10 to at least a portion of the surface.

Stents are described at, for example, page 34, lines 3-8 and 12-16, and page 35, lines 26-33.

Forming the active agent delivery system is described at, for example, from page 16, line 3 through page 19, line 21; page 12, lines 14-17; from page 18, line 18 through page 19, line 5; page 27, lines 21-28; page 30, lines 25-30; from page 30, line 3 through page 31, line 12; and from page 58, line 22 through page 61, line 24.

Adhering an active agent delivery system to a portion of the stent surface is described at, for example, page 35, lines 3-25.

Independent Claim 54

Claim 54 is directed to a method of making a stent. The method includes:

providing a stent comprising a surface; and

adhering an active agent delivery system formed by the method of claim 20 to at least a portion of the surface.

Stents are described at, for example, page 34, lines 3-8 and 12-16, and page 35, lines 26-33.

Forming the active agent delivery system is described at, for example, from page 16, line 3 through page 19, line 21; page 12, lines 14-17; from page 18, line 18 through page 19, line 5; page 27, lines 21-28; page 31, lines 13-18; page 30, lines 3-9; and from page 31, line 19 through page 32, line 4.

Adhering an active agent delivery system to a portion of the stent surface is described at, for example, page 35, lines 3-25.

Independent Claim 55

Claim 55 is directed to a method of making a stent. The method includes:

providing a stent comprising a surface; and

adhering an active agent delivery system formed by the method of claim 32 to at least a portion of the surface.

Stents are described at, for example, page 34, lines 3-8 and 12-16, and page 35, lines 26-33.

Forming the active agent delivery system is described at, for example, from page 16, line 3 through page 19, line 21; page 12, lines 14-17; from page 18, line 18 through page 19, line 5; page 27, lines 21-28; page 32, lines 5-10; and page 32, lines 11-23.

Adhering an active agent delivery system to a portion of the stent surface is described at, for example, page 35, lines 3-25.

Independent Claim 56

Claim 56 is directed to a method of designing an active agent delivery system for delivering an active agent over a preselected dissolution time (t) through a preselected critical dimension (x) of a miscible polymer blend that controls delivery of the active agent. The method includes:

providing an active agent having a solubility parameter and a molecular weight no greater than about 1200 g/mol;

providing a first miscible polymer having a solubility parameter;

selecting a second polymer to be miscible with the first polymer and having a solubility parameter, wherein:

the difference between the solubility parameter of the active agent and at least one solubility parameter of each of the polymers is no greater than about 10 $J^{1/2}/cm^{3/2}$, and the difference between at least one solubility parameter of each of the polymers is no greater than about 5 $J^{1/2}/cm^{3/2}$;

the difference between at least one Tg of each of the polymers is sufficient to include the target diffusivity; combining the polymers to form a miscible polymer blend; and

combining the miscible polymer blend with the active agent to form an active agent delivery system having the preselected dissolution time through a preselected critical dimension of the miscible polymer blend;

wherein:

the miscible polymer blend comprises at least one hydrophobic cellulose derivative and at least one miscible polyvinyl homopolymer or copolymer selected from the group consisting of a polyvinyl alkylate homopolymer or copolymer, a polyvinyl alkyl ether homopolymer or copolymer, a polyvinyl acetal homopolymer or copolymer, and combinations thereof; or

the miscible polymer blend comprises a polyurethane and a second miscible polymer that is not a hydrophobic cellulose ester; wherein the second miscible polymer is selected from the group consisting of a polycarbonate, a polysulfone, a polyurethane, a polyphenylene oxide, a polyimide, a polyamide, a polyester, a polyether, a polyketone, a polyepoxide, a styrene-acrylonitrile copolymer, a poly(vinyl ester), a poly(vinyl ether), a polyacrylate, a poly(methyl acrylate), a polymethacrylate, a poly(methyl methacrylate), and combinations thereof; or

the miscible polymer blend comprises a poly(ethylene-co-(meth)acrylate) and a second miscible polymer not including poly(ethylene vinyl acetate); wherein the second miscible polymer is selected from the group consisting of a poly(vinyl alkylate) homopolymer or copolymer, a poly(vinyl alkyl ether) homopolymer or copolymer, a poly(vinyl acetal) homopolymer or copolymer, a poly(alkyl and/or aryl methacrylate) homopolymer or copolymer, a poly(alkyl and/or aryl acrylate) homopolymer or copolymer, and combinations thereof; or

the miscible polymer blend comprises miscible polymers selected from the group consisting of polyacrylonitriles, cyanoacrylates, methacrylonitriles, hydrophilic cellulosics, and combinations thereof; or

the miscible polymer blend comprises a polyurethane and at least one miscible hydrophilic polymer selected from the group consisting of a polyurethane, a polyvinyl alcohol, a poly(alkylene ether), a polyvinyl pyridine, a polyvinyl pyrrolidone, a polyacrylonitrile, a polyacrylamide, a polyvinyl pyrrolidone/polyvinyl acetate

copolymer, a sulfonated polystyrene, a polyvinyl pyrrolidone/polystyrene copolymer, a polysaccharide, a xanthan, a hydrophilic cellulose derivative, a hyaluronic acid, a hydrophilic polyacrylate, a hydrophilic polymethacrylate, a DNA or analog thereof, an RNA or analog thereof, heparin, a chitosan, a polyethylene imine, a polyacrylamide, an amine-containing polymer, and combinations thereof; or

the miscible polymer blend comprises two hydrophobic polyurethanes as a cap coat in a reservoir system.

Providing an active agent having a solubility parameter and a molecular weight of no greater than about 1200 g/mol is described at, for example, from page 16, line 3 through page 19, line 21.

Selecting the polymers of the miscible polymer blend based on their miscibility is described at, for example, from page 18, line 18 through page 19, line 5.

Selecting polymers based on the difference between at least one Tg of at least two of the polymers corresponding to a range of diffusivities that includes the target diffusivity is described at, for example, page 26, lines 29-33.

Combining the active agent with a miscible polymer blend that is capable of controlling delivery of the active agent is described at, for example, page 12, lines 14-17.

Suitable polymers are described at, for example, from page 29, line 30 through page 31, line 12 and from page 58, line 22 through page 61, line 24.

Independent Claim 63

Claim 63 is directed to a method of designing an active agent delivery system for delivering an active agent over a preselected dissolution time (t) through a preselected critical dimension (x) of a miscible polymer blend that controls delivery of the active agent. The method includes:

providing an active agent having a solubility parameter and a molecular weight greater than about 1200 g/mol;

providing a first miscible polymer having a solubility parameter;

selecting a second polymer to be miscible with the first polymer and having a solubility parameter, wherein:

the difference between the solubility parameter of the active agent and at least one solubility parameter of each of the polymers is no greater than about 10 $J^{1/2}/cm^{3/2}$, and the difference between at least one solubility parameter of each of the polymers is no greater than about 5 $J^{1/2}/cm^{3/2}$;

the difference between the swellabilities of the polymers is sufficient to include the target diffusivity;

combining the polymers to form a miscible polymer blend; and

combining the miscible polymer blend with the active agent to form an active agent delivery system having the preselected dissolution time through a preselected critical dimension of the miscible polymer blend;

wherein:

the miscible polymer blend comprises at least one hydrophobic cellulose derivative and a second polymer selected from the group consisting of polyethylene, polypropylene, polyisobutylene, polystyrene, poly(vinyl chloride), poly(vinyl bromide), poly(vinylidene chloride), poly(tetrafluoroethylene), poly(chloro trifluoroethylene), poly(vinyl alcohol), poly(vinyl acetate), poly(vinyl propionate), poly(methyl acylate), poly(ethyl acrylate), poly(propyl acrylate), poly(butyl acrylate), poly(isobutyl acrylate), poly(2,2,3,3,4,4,4-heptafluorobutyl acrylate), poly(methyl methacrylate), poly(ethyl methacrylate), poly(butyl methacrylate), poly(isobutyl methacrylate), poly(tert-butyl methacrylate), poly(benzyl methacrylate), poly(ethoxyethyl methacrylate), polyacrylonitrile, polymethacrylonitrile, poly(alpha-cyanomethyl acrylate), polybutadiene, polyisoprene, polychloroprene, polyformaldehyde, poly(tetramethylene oxide), poly(propylene oxide), polyepichlorohydrin, poly(ethylene sulphide), poly(styrene sulphide), poly(ethylene terephthalate), poly(8-aminocaprylic acid),

poly(hexamethylene adipamide), polyurethane hard segment (MDI + BDO), poly(bisphenyl A carbonate), cellulose acetate butyrate, phenoxy, poly(vinyl pyrrolidone), poly(vinyl pyrrolidone)-co-poly(vinyl acetate), poly(ethylene oxide), and combinations thereof; or

the miscible polymer blend comprises at least one hydrophilic polymer and a second miscible polymer that is hydrophilic or hydrophobic; wherein the hydrophilic polymer is selected from the group consisting of a polyurethane, a polyvinyl alcohol, a poly(alkylene ether), a polyvinyl pyridine, a polyvinyl pyrrolidone, a polyacrylonitrile, a polyacrylamide, a polyvinyl pyrrolidone/polyvinyl acetate copolymer, a sulfonated polystyrene, a polyvinyl pyrrolidone/polystyrene copolymer, a polysaccharide, a xanthan, a hydrophilic cellulose derivative, a hyaluronic acid, a hydrophilic polyacrylate, a hydrophilic polymethacrylate, a DNA or analog thereof, an RNA or analog thereof, heparin, a chitosan, a polyethylene imine, a polyacrylamide, an amine-containing polymer, and combinations thereof; and the hydrophobic polymer is selected from the group consisting of a polyurethane, a polycarbonate, a polysulfone, a polyphenylene osied, a polyimide, a polyamide, a polyester, a polyether, a polyketone, a polyepoxide, a styrene-acrylonitrile copolymer, a polyvinyl alkylate, a polyvinyl alkyl ether, a polyvinyl acetal, a hydrophobic cellulose derivative, and combinations thereof.

Providing an active agent having a solubility parameter and a molecular weight of no greater than about 1200 g/mol is described at, for example, from page 16, line 3 through page 19, line 21.

Selecting the polymers of the miscible polymer blend based on their miscibility is described at, for example, from page 18, line 18 through page 19, line 5.

Selecting polymers based on the swellabilities of the polymers is described at, for example, page 29, lines 4-22.

Combining the active agent with a miscible polymer blend that is capable of controlling delivery of the active agent is described at, for example, page 12, lines 14-17.

Suitable polymers are described at, for example, page 30, lines 3-9; from page 31, line 19 through page 32, line 4; and page 32, lines 11-23.

Independent Claim 71

Claim 71 is directed to a method for delivering an active agent to a subject. The method includes:

providing the active agent delivery system formed according to the method of claim 1; and

contacting the active agent delivery system with a bodily fluid, organ, or tissue of a subject.

The active agent delivery system is described at, for example, 16, line 3 through page 19, line 21; page 12, lines 14-17; page 18, line 18 through page 19, line 5; page 27, lines 21-28; page 31, lines 13-18; and from page 29, line 30 through page 30, line 24.

Contacting the active agent delivery system with a bodily fluid, organ, or tissue of a subject is described at, for example, page 33, lines 25-30.

Independent Claim 72

Claim 72 is directed to a method for delivering an active agent to a subject. The method includes:

providing the active agent delivery system formed according to the method of claim 10; and

contacting the active agent delivery system with a bodily fluid, organ, or tissue of a subject.

The active agent delivery system is described at, for example, from page 16, line 3 through page 19, line 21; page 12, lines 14-17; from page 18, line 18 through page 19, line 5; page 27, lines 21-28; page 30, lines 25-30; from page 30, line 3 through page 31, line 12; and from page 58, line 22 through page 61, line 24.

Contacting the active agent delivery system with a bodily fluid, organ, or tissue of a subject is described at, for example, page 33, lines 25-30.

Independent Claim 73

Claim 73 is directed to a method for delivering an active agent to a subject. The method includes:

providing the active agent delivery system formed according to the method of claim 20; and

contacting the active agent delivery system with a bodily fluid, organ, or tissue of a subject.

The active agent delivery system is described at, for example, from page 16, line 3 through page 19, line 21; page 12, lines 14-17; from page 18, line 18 through page 19, line 5; page 27, lines 21-28; page 31, lines 13-18; page 30, lines 3-9; and from page 31, line 19 through page 32, line 4.

Contacting the active agent delivery system with a bodily fluid, organ, or tissue of a subject is described at, for example, page 33, lines 25-30.

Independent Claim 74

Claim 74 is directed to a method for delivering an active agent to a subject. The method includes:

providing the active agent delivery system formed according to the method of claim 32; and

contacting the active agent delivery system with a bodily fluid, organ, or tissue of a subject.

The active agent delivery system is described at, for example, from page 16, line 3 through page 19, line 21; page 12, lines 14-17; from page 18, line 18 through page 19, line 5; page 27, lines 21-28; page 32, lines 5-10; and page 32, lines 11-23.

Contacting the active agent delivery system with a bodily fluid, organ, or tissue of a subject is described at, for example, page 33, lines 25-30.

Independent Claim 75

Claim 75 is directed to a method for tuning the delivery of an active agent to a subject. The method includes:

providing an active agent delivery system comprising an active agent having a molecular weight no greater than about 1200 g/mol and a miscible polymer blend, comprising:

providing a first miscible polymer having a solubility parameter;

selecting a second polymer to be miscible with the first polymer and having a solubility parameter;

combining the first polymer and the second polymer to form a miscible polymer blend that controls the delivery of the active agent; wherein the difference between the solubility parameter of the active agent and at least one solubility parameter of each of the polymers is no greater than about 10 $J^{1/2}/cm^{3/2}$, and the difference between at least one solubility parameter of each of the polymers is no greater than about 5 $J^{1/2}/cm^{3/2}$; and

combining the miscible polymers and an active agent in amounts sufficient to form the active agent delivery system comprising a miscible polymer blend capable of delivering an active agent at a predetermined release rate; and

contacting the active agent delivery system with a bodily fluid, organ, or tissue of a subject to deliver the active agent at the predetermined release rate;

wherein:

the miscible polymer blend comprises at least one hydrophobic cellulose derivative and at least one miscible polyvinyl homopolymer or copolymer selected from the group consisting of a polyvinyl alkylate homopolymer or copolymer, a polyvinyl alkyl ether homopolymer or copolymer, a polyvinyl acetal homopolymer or copolymer, and combinations thereof; or

the miscible polymer blend comprises a polyurethane and a second miscible polymer that is not a hydrophobic cellulose ester; wherein the second miscible polymer is selected from the group consisting of a polycarbonate, a polysulfone, a polyurethane, a polyphenylene oxide, a polyimide, a polyamide, a polyester, a polyether, a polyketone, a polyepoxide, a styrene-acrylonitrile copolymer, a poly(vinyl ester), a poly(vinyl ether), a polyacrylate, a poly(methyl acrylate), a polymethacrylate, a poly(methyl methacrylate), and combinations thereof; or

the miscible polymer blend comprises a poly(ethylene-co-(meth)acrylate) and a second miscible polymer not including poly(ethylene vinyl acetate); wherein the second miscible polymer is selected from the group consisting of a poly(vinyl alkylate) homopolymer or copolymer, a poly(vinyl alkyl ether) homopolymer or copolymer, a poly(vinyl acetal) homopolymer or copolymer, a poly(alkyl and/or aryl methacrylate) homopolymer or copolymer, a poly(alkyl and/or aryl acrylate) homopolymer or copolymer, and combinations thereof; or

the miscible polymer blend comprises miscible polymers selected from the group consisting of polyacrylonitriles, cyanoacrylates, methacrylonitriles, hydrophilic cellulosics, and combinations thereof; or

the miscible polymer blend comprises a polyurethane and at least one miscible hydrophilic polymer selected from the group consisting of a polyurethane, a polyvinyl alcohol, a poly(alkylene ether), a polyvinyl pyridine, a polyvinyl pyrrolidone, a polyacrylonitrile, a polyacrylamide, a polyvinyl pyrrolidone/polyvinyl acetate copolymer, a sulfonated polystyrene, a polyvinyl pyrrolidone/polystyrene copolymer, a polysaccharide, a xanthan, a hydrophilic cellulose derivative, a hyaluronic acid, a hydrophilic polyacrylate, a hydrophilic polymethacrylate, a DNA or analog thereof, an RNA or analog thereof, heparin, a chitosan, a polyethylene imine, a polyacrylamide, an amine-containing polymer, and combinations thereof; or

the miscible polymer blend comprises two hydrophobic polyurethanes as a cap coat in a reservoir system.

Providing an active agent having a solubility parameter and a molecular weight of no greater than about 1200 g/mol is described at, for example, from page 16, line 3 through page 19, line 21.

Selecting the polymers of the miscible polymer blend based on their miscibility is described at, for example, from page 18, line 18 through page 19, line 5.

Combining the active agent with a miscible polymer blend that is capable of controlling delivery of the active agent is described at, for example, page 12, lines 14-17.

Contacting the active agent delivery system with a bodily fluid, organ, or tissue of a subject is described at, for example, page 33, lines 25-30.

Suitable polymers are described at, for example, from page 29, line 30 through page 32, line 4; and from page 58, line 22 through page 61, line 24.

Independent Claim 76

Claim 76 is directed to a method of forming a tunable active agent delivery system. The method includes:

providing a first miscible polymer having a solubility parameter;

selecting a second polymer to be miscible with the first polymer to form a miscible polymer blend that controls the delivery of the active agent having a molecular weight of no greater than about 1200 g/mol; wherein the difference between the solubility parameter of the active agent and at least one solubility parameter of each of the polymers is no greater than about 10 $J^{1/2}/cm^{3/2}$, and the difference between at least one solubility parameter of each of the polymers is no greater than about 5 $J^{1/2}/cm^{3/2}$; and

combining the miscible polymers in amounts sufficient to form a miscible polymer blend capable of delivering the active agent at a predetermined release rate; and

combining at least one active agent with the miscible polymer blend such that the miscible polymer blend controls the delivery of the active agent at the predetermined release rate;

wherein:

the miscible polymer blend comprises at least one hydrophobic cellulose derivative and at least one miscible polyvinyl homopolymer or copolymer selected from the group consisting of a polyvinyl alkylate homopolymer or copolymer, a polyvinyl alkyl ether homopolymer or copolymer, a polyvinyl acetal homopolymer or copolymer, and combinations thereof; or

the miscible polymer blend comprises a polyurethane and a second miscible polymer that is not a hydrophobic cellulose ester; wherein the second miscible polymer is selected from the group consisting of a polycarbonate, a polysulfone, a polyurethane, a polyphenylene oxide, a polyimide, a polyamide, a polyester, a polyether, a polyketone, a polyepoxide, a styrene-acrylonitrile copolymer, a poly(vinyl ester), a poly(vinyl ether), a polyacrylate, a poly(methyl acrylate), a polymethacrylate, a poly(methyl methacrylate), and combinations thereof; or

the miscible polymer blend comprises a poly(ethylene-co-(meth)acrylate) and a second miscible polymer not including poly(ethylene vinyl acetate); wherein the second miscible polymer is selected from the group consisting of a poly(vinyl alkylate) homopolymer or copolymer, a poly(vinyl alkyl ether) homopolymer or copolymer, a poly(vinyl acetal) homopolymer or copolymer, a poly(alkyl and/or aryl methacrylate) homopolymer or copolymer, a poly(alkyl and/or aryl acrylate) homopolymer or copolymer, and combinations thereof; or

the miscible polymer blend comprises miscible polymers selected from the group consisting of polyacrylonitriles, cyanoacrylates, methacrylonitriles, hydrophilic cellulosics, and combinations thereof; or

the miscible polymer blend comprises a polyurethane and at least one miscible hydrophilic polymer selected from the group consisting of a polyurethane, a polyvinyl alcohol, a poly(alkylene ether), a polyvinyl pyridine, a polyvinyl pyrrolidone, a polyacrylonitrile, a polyacrylamide, a polyvinyl pyrrolidone/polyvinyl acetate

copolymer, a sulfonated polystyrene, a polyvinyl pyrrolidone/polystyrene copolymer, a polysaccharide, a xanthan, a hydrophilic cellulose derivative, a hyaluronic acid, a hydrophilic polyacrylate, a hydrophilic polymethacrylate, a DNA or analog thereof, an RNA or analog thereof, heparin, a chitosan, a polyethylene imine, a polyacrylamide, an amine-containing polymer, and combinations thereof; or

the miscible polymer blend comprises two hydrophobic polyurethanes as a cap coat in a reservoir system.

Providing an active agent having a solubility parameter and a molecular weight of no greater than about 1200 g/mol is described at, for example, from page 16, line 3 through page 19, line 21.

Selecting the polymers of the miscible polymer blend based on their miscibility is described at, for example, from page 18, line 18 through page 19, line 5.

Combining the active agent with a miscible polymer blend that is capable of controlling delivery of the active agent is described at, for example, page 12, lines 14-17.

Suitable polymers are described at, for example, from page 29, line 30 through page 32, line 4; and from page 58, line 22 through page 61, line 24.

Independent Claim 77

Claim 77 is directed to a method of forming a tunable active agent delivery system. The method includes:

providing a first miscible polymer having a solubility parameter;

selecting a second polymer to be miscible with the first polymer to form a miscible polymer blend that controls the delivery of the active agent having a molecular weight of greater than about 1200 g/mol; wherein the difference between the solubility parameter of the active agent and at least one solubility parameter of each of the polymers is no greater than about 10 $J^{1/2}/cm^{3/2}$, and the difference between at least one solubility parameter of each of the polymers is no greater than about 5 $J^{1/2}/cm^{3/2}$; and

combining the first polymer and the second polymer in amounts sufficient to form a miscible polymer blend capable of delivering the active agent at a predetermined release rate; and

combining at least one active agent with the miscible polymer blend such that the miscible polymer blend controls the delivery of the active agent at the predetermined release rate;

wherein:

the miscible polymer blend comprises at least one hydrophobic cellulose derivative and at least one miscible polymer selected from the group consisting of polyethylene, polypropylene, polyisobutylene, polystyrene, poly(vinyl chloride), poly(vinyl bromide), poly(vinylidene chloride), poly(tetrafluoroethylene), poly(chloro trifluoroethylene), poly(vinyl alcohol), poly(vinyl acetate), poly(vinyl propionate), poly(methyl acylate), poly(ethyl acrylate), poly(propyl acrylate), poly(butyl acrylate), poly(isobutyl acrylate), poly(2,2,3,3,4,4,4-heptafluorobutyl acrylate), poly(methyl methacrylate), poly(ethyl methacrylate), poly(butyl methacrylate), poly(isobutyl methacrylate), poly(tert-butyl methacrylate), poly(benzyl methacrylate), poly(ethoxyethyl methacrylate), polyacrylonitrile, polymethacrylonitrile, poly(alpha-cyanomethyl acrylate), polybutadiene, polyisoprene, polychloroprene, polyformaldehyde, poly(tetramethylene oxide), poly(propylene oxide), polyepichlorohydrin, poly(ethylene sulphide), poly(styrene sulphide), poly(ethylene terephthalate), poly(8-aminocaprylic acid), poly(hexamethylene adipamide), polyurethane hard segment (MDI + BDO), poly(bisphenyl A carbonate), cellulose acetate butyrate, phenoxy, poly(vinyl pyrrolidone), poly(vinyl pyrrolidone)-co-poly(vinyl acetate), poly(ethylene oxide), and combinations thereof; or

the miscible polymer blend comprises at least one hydrophilic polymer and a second miscible polymer that is hydrophilic or hydrophobic; wherein the hydrophilic polymer is selected from the group consisting of a polyurethane, a polyvinyl alcohol, a poly(alkylene ether), a polyvinyl pyridine, a polyvinyl pyrrolidone, a polyacrylonitrile, a polyacrylamide, a polyvinyl

pyrrolidone/polyvinyl acetate copolymer, a sulfonated polystyrene, a polyvinyl pyrrolidone/polystyrene copolymer, a polysaccharide, a xanthan, a hydrophilic cellulose derivative, a hyaluronic acid, a hydrophilic polyacrylate, a hydrophilic polymethacrylate, a DNA or analog thereof, an RNA or analog thereof, heparin, a chitosan, a polyethylene imine, a polyacrylamide, an amine-containing polymer, and combinations thereof; and the hydrophobic polymer is selected from the group consisting of a polyurethane, a polycarbonate, a polysulfone, a polyphenylene osied, a polyimide, a polyamide, a polyester, a polyether, a polyketone, a polyepoxide, a styrene-acrylonitrile copolymer, a polyvinyl alkylate, a polyvinyl alkyl ether, a polyvinyl acetal, a hydrophobic cellulose derivative, and combinations thereof.

Providing an active agent having a solubility parameter and a molecular weight of no greater than about 1200 g/mol is described at, for example, from page 16, line 3 through page 19, line 21.

Selecting the polymers of the miscible polymer blend based on their miscibility is described at, for example, from page 18, line 18 through page 19, line 5.

Combining the active agent with a miscible polymer blend that is capable of controlling delivery of the active agent is described at, for example, page 12, lines 14-17.

Suitable polymers are described at, for example, page 30, lines 3-9 and from page 31, line 19 through page 32, line 23.

Independent Claim 78

Claim 78 is directed to a method for tuning the delivery of an active agent to a subject. The method includes:

providing an active agent delivery system comprising an active agent having a molecular weight greater than about 1200 g/mol and a miscible polymer blend, comprising:

providing a first miscible polymer having a solubility parameter;

selecting a second polymer to be miscible with the first polymer and having solubility parameter;

combining the first polymer and the second polymer to form a miscible polymer blend that controls the delivery of the active agent; wherein the difference between the solubility parameter of the active agent and at least one solubility parameter of each of the polymers is no greater than about 10 $J^{1/2}/cm^{3/2}$, and the difference between at least one solubility parameter of each of the polymers is no greater than about 5 $J^{1/2}/cm^{3/2}$; and

combining the miscible polymers and an active agent in amounts sufficient to form the active agent delivery system comprising a miscible polymer blend capable of delivering an active agent at a predetermined release rate; and

contacting the active agent delivery system with a bodily fluid, organ, or tissue of a subject to deliver the active agent at the predetermined release rate;

wherein:

the miscible polymer blend comprises at least one hydrophobic cellulose derivative and at least one miscible polymer selected from the group consisting of polyethylene, polypropylene, polyisobutylene, polystyrene, poly(vinyl chloride), poly(vinyl bromide), poly(vinylidene chloride), poly(tetrafluoroethylene), poly(chloro trifluoroethylene), poly(vinyl alcohol), poly(vinyl acetate), poly(vinyl propionate), poly(methyl acylate), poly(ethyl acrylate), poly(propyl acrylate), poly(butyl acrylate), poly(isobutyl acrylate), poly(2,2,3,3,4,4,4-heptafluorobutyl acrylate), poly(methyl methacrylate), poly(ethyl methacrylate), poly(butyl methacrylate), poly(isobutyl methacrylate), poly(tert-butyl methacrylate), poly(benzyl methacrylate), poly(ethoxyethyl methacrylate), polyacrylonitrile, polymethacrylonitrile, poly(alpha-cyanomethyl acrylate), polybutadiene, polyisoprene, polychloroprene, polyformaldehyde, poly(tetramethylene oxide), poly(propylene oxide), polyepichlorohydrin, poly(ethylene sulphide), poly(styrene sulphide), poly(ethylene terephthalate), poly(8-aminocaprylic acid), poly(hexamethylene adipamide), polyurethane hard segment (MDI + BDO), poly(bisphenyl A carbonate), cellulose acetate butyrate, phenoxy, poly(vinyl

pyrrolidone), poly(vinyl pyrrolidone)-co-poly(vinyl acetate), poly(ethylene oxide), and combinations thereof; or

the miscible polymer blend comprises at least one hydrophilic polymer and a second miscible polymer that is hydrophilic or hydrophobic; wherein the hydrophilic polymer is selected from the group consisting of a polyurethane, a polyvinyl alcohol, a poly(alkylene ether), a polyvinyl pyridine, a polyvinyl pyrrolidone, a polyacrylonitrile, a polyacrylamide, a polyvinyl pyrrolidone/polyvinyl acetate copolymer, a sulfonated polystyrene, a polyvinyl pyrrolidone/polystyrene copolymer, a polysaccharide, a xanthan, a hydrophilic cellulose derivative, a hyaluronic acid, a hydrophilic polyacrylate, a hydrophilic polymethacrylate, a DNA or analog thereof, an RNA or analog thereof, heparin, a chitosan, a polyethylene imine, a polyacrylamide, an amine-containing polymer, and combinations thereof; and the hydrophobic polymer is selected from the group consisting of a polyurethane, a polycarbonate, a polysulfone, a polyphenylene osied, a polyimide, a polyamide, a polyester, a polyether, a polyketone, a polyepoxide, a styrene-acrylonitrile copolymer, a polyvinyl alkylate, a polyvinyl alkyl ether, a polyvinyl acetal, a hydrophobic cellulose derivative, and combinations thereof.

Providing an active agent having a solubility parameter and a molecular weight of no greater than about 1200 g/mol is described at, for example, from page 16, line 3 through page 19, line 21.

Selecting the polymers of the miscible polymer blend based on their miscibility is described at, for example, from page 18, line 18 through page 19, line 5.

Combining the active agent with a miscible polymer blend that is capable of controlling delivery of the active agent is described at, for example, page 12, lines 14-17.

Contacting the active agent delivery system with a bodily fluid, organ, or tissue of a subject is described at, for example, page 33, lines 25-30.

Suitable polymers are described at, for example, page 30, lines 3-9 and from page 31, line 19 through page 32, line 23.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether claims 1-18 and 20-78 are anticipated under 35 U.S.C. §102(b) by Hossainy *et al.* (U.S. Patent No. 6,153,252).

Whether claims 1-18 and 20-78 are anticipated under 35 U.S.C. §102(b) by Whitbourne *et al.* (U.S. Patent No. 6,110,483).

Whether claims 1-18 and 20-78 are anticipated under 35 U.S.C. §102(e) by Sirhan *et al.* (U.S. Patent Application Publication No. US 2002/0082679 A1).

Whether claims 1-18 and 20-78 are unpatentable under 35 U.S.C. §103(a) over Hossainy *et al.* (U.S. Patent No. 6,153,252).

Whether claims 1-18 and 20-78 are unpatentable under 35 U.S.C. §103(a) over Whitbourne *et al.* (U.S. Patent No. 6,110,483).

Whether claims 1-18 and 20-78 are unpatentable under 35 U.S.C. §103(a) over Sirhan *et al.* (U.S. Patent Application Publication No. US 2002/0082679 A1).

VII. ARGUMENT

Claims 1-18 and 20-78 are not anticipated under 35 U.S.C. §102(b) by Hossainy *et al.* (U.S. Patent No. 6,153,252)

Claims 1-18 and 20-78 stand rejected under 35 U.S.C. §102(b) as anticipated by Hossainy *et al.*

M.P.E.P. §2131 states, "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Appellants respectfully submit that Hossainy *et al.* cannot anticipate claims 1-51 because Hossainy *et al.* fail to set forth each and every feature recited in the claims.

Claims 1, 10, 20, 32, 44, 46, 48, 50, 52 to 56, 63, and 71 to 78 are independent. Each of the remaining claims depends, directly or indirectly, from one of the independent claims and, therefore, includes all of the features of the independent claim from which it depends.

Each independent claim includes forming an active agent delivery system that includes some variation of selecting a second polymer from a specified group of polymers to be miscible with a specified first polymer identified elsewhere in the claim. In addition, forming the active agent delivery system includes selecting the components–e.g., the active agent, first polymer, and second polymer–to balance one or more of a plurality of properties of, and/or relationships between, components in order to achieve the desired delivery character of the delivery system as a whole. Thus, the second polymers from which to choose are, in part, determined by the identity of the first polymer (compare the different polymer combinations recited in, for example, claims 1, 10, 20, and 32). Additional properties and/or relationships that are considered include one or more of: differences in solubility parameter between the active agent and at least one polymer (e.g., claims 1, 10, 20, 32, 56, 63, and 75 to 78), differences in solubility parameter between polymer (e.g., claims 1, 10, 20, 32, 56, 63, and 75 to 78), diffusivity (e.g., claims 1, 10, 20, and 32), molar average solubility parameter (e.g., claims 1, 10, 20, and 32), swellability (e.g., claims 1, 10, 20, and 32), glass transition temperature (e.g., claim 56), and/or differences in swellabilities (e.g., claim 63).

Hossainy *et al.* teach processes for coating stents and stents coated using the described process (Hossainy *et al.*, Abstract). Hossainy *et al.* teach a variety of properties on which the selection of polymers for forming the stent coating can be based: tackiness, adherence, deformability, toughness, elasticity, melting point (*Id.*, column 5, lines 39-51), active agent release rate (*Id.*, column 7, lines 18-55 and column 9, lines 26-32), and molecular weight (*Id.*, column 9, lines 29-32). Hossainy *et al.* neither expressly nor inherently teach Appellants' claimed invention, particularly selecting a second polymer based on its miscibility with the first polymer and/or any of the other properties recited in Appellants' claims.

In contrast, each of Appellants' independent claims recites a method that includes the express, intentional, and conscious selection of particularly identified groups of second polymers based on miscibility with the specified first polymer and the one or more additional property and/or relationship that is specified in the claim. The present claims recite a cognitive

and discretionary step that was unknown and, therefore, impossible prior to Appellants' disclosure.

Hossainy *et al.* merely recite long laundry lists of general classes of polymers (*Id.*, column 4, line 15 through column 5, line 38), some of the members of which could conceivably be miscible with other members of the recited general classes under certain conditions. In contrast, Appellants' claims recite methods that include specifically selecting a second polymer, in part, to be miscible with the specified first polymer–i.e., selected based, in part, on its miscibility–and, further, so that the components of the active agent delivery system possess the specific one or more additional properties and/or relationships recited in Appellants' claims. Appellants' active agent delivery system is not based merely on selecting polymers that are miscible with one another. Appellants' claimed methods include forming an active agent delivery system that is carefully designed, taking into account certain properties of the active agent and each polymer, to provide the desired delivery of the active agent. In the absence of evidence that one of the specific polymer selection criteria described in Hossainy *et al.* necessarily results in selection of miscible polymers so that the components of the active agent delivery system further include the additional properties and/or relationships recited in Appellants' claims, Hossainy *et al.* cannot anticipate Appellants' claims.

The Final Office Action mailed April 11, 2007 deems the remarks above unpersuasive, stating:

> The relevance of this assertion is unclear. Clearly Hossainy teaches a method of forming a coating for a stent, the coating can be comprised of the same polymer blend as [Appellants'] claimed invention, since the polymers are the same it is inherent they will have the same solubility parameters and the difference between the solubility parameters of the polymers will also be the same. It appears as though [Appellants] are claiming an unknown property...of an old combination. (Final Office Action, pages 2-3).

The relevance of Appellants' assertion is that Appellants' claims are directed to methods, but the Office Action rejects the claims based on the disclosure in Hossainy *et al.* of certain possible but unidentified combinations of polymers rather than any actual method disclosed in Hossainy *et al.*

Hossainy *et al.* cannot teach "the same polymer blend as [Appellants'] claimed invention" as suggested in the Final Office Action because Appellants' claimed invention is not a polymer blend. Likewise, Appellants are not claiming an unknown property of an old combination, as suggested in the Final Office Action. Rather, Appellants claim novel methods that include a specific selection process that is neither described nor suggested in Hossainy *et al.*

As noted above, Hossainy *et al.* merely teach general classes of polymers, with no direction for selecting particular combinations of polymers based on miscibility or any of the other properties recited in Appellants' claims.

In contrast, each of the claimed methods includes selecting a second polymer from among a specified group of polymers that is, in part, based on the identity of a first polymer. For example, claim 1 recites that the miscible polymer blend can include a first polymer that includes at least one hydrophobic cellulose derivative and a second polymer that includes at least one miscible polyvinyl homopolymer or copolymer selected from the group consisting of a polyvinyl alkylate homopolymer or copolymer, a polyvinyl alkyl ether homopolymer or copolymer, a polyvinyl acetal homopolymer or copolymer, and combinations thereof. Alternatively, the miscible polymer blend of claim 1 can include a first polymer that includes a polyurethane and a second miscible polymer that is not a hydrophobic cellulose ester but is selected from the group consisting of a polycarbonate, a polysulfone, a polyurethane, a polyphenylene oxide, a polyimide, a polyamide, a polyester, a polyether, a polyketone, a polyepoxide, a styrene-acrylonitrile copolymer, a poly(vinyl ester), a poly(vinyl ether), a polyacrylate, a poly(methyl acrylate), a polymethacrylate, a poly(methyl methacrylate), and combinations thereof. Claim 1 recites additional specific basic polymer combinations. Each of claims 10, 20, and 32 further recite still more different basic polymer combinations. In addition, each independent claim recites that the second polymer is selected to be miscible with the first polymer. Appellants' claims further describe selecting a second polymer so that the components of the active agent delivery system–i.e., polymers and/or active agents–possess one or more additional properties and/or relationships such as, for example, differences in solubility

parameter between the active agent and at least one polymer, differences in solubility parameter between polymer, diffusivity, molar average solubility parameter, swellability, glass transition temperature, and/or differences in swellabilities.

Hossainy *et al.* fail to teach selecting the particular polymer combinations specified in Appellants' claims. Hossainy *et al.*, further fail to teach basing the selection of polymers on the particular criteria set forth in Appellants' claims. Thus, Hossainy *et al.* fail to describe any method that anticipates Appellants' claimed methods and Hossainy *et al.* fail to teach the particular subgenus combinations of polymers recited in Appellants' method claims.

The miscible polymer blend formed from the specific polymers selected as recited in Appellants' claims are useful for forming an active agent delivery system that is capable of tuning delivery of an active agent in a manner that was unknown prior to Appellants' disclosure. Because these qualities of the recited miscible polymer blends were unknown prior to Appellants' disclosure, the polymer selection process recited in Appellants' claims that is based on exploiting the previously unknown tunable active agent delivery qualities of miscible polymer blends prepared from the recited polymers was impossible. Therefore, Hossainy *et al.* cannot possibly anticipate Appellants' method claims.

The Examiner's rejection appears to be based on a theory that Hossainy *et al.* inherently teach combinations of polymers that encompass combination of polymers recited in Appellants' methods. The Examiner's reliance on inherency is misplaced for at least three reasons.

First, whether Hossainy *et al.* teach similar coatings is irrelevant because Appellants' claims are not directed to the coatings themselves, but rather are directed to methods by which the coatings are formed. Appellants' claims recite the cognitive and discretionary step of selecting the second polymer to be miscible with the first polymer and to so that the components of the active agent delivery system possess one or more additional property and or relationship. This cognitive and discretionary portion of the polymer selection process is neither

taught nor suggested in Hossainy *et al.* even though Hossainy *et al.* provide an extensive listing of considerations that can be used to select polymers.

The Non-Final Office Action, mailed November 5, 2007 responds as follows:

> [Appellants'] claims do not actually recite selecting two polymers based on their solubility parameters, rather the claims recite that a first miscible polymer is provided and then selecting another second polymer and combining the two, forming a miscible polymer blend...The selection of the second polymer could be made by numerous means known to those of ordinary skill in the art. (Non-Final Office Action, pages 12-13).

Appellants disagree. The characterization of Appellants' claims cited above omits consideration of certain features of Appellants' claims. First, contrary to the position stated in the Non-Final Office Action, each of Appellants' claims recites selecting polymers based, in part, on the difference of their solubility parameters, not only with respect to each other, but also with respect to the active agent. Second, the second polymer is selected to be miscible with the first polymer. Indeed, Appellants' claim 1 recites, in part, "...a second polymer selected to be miscible with the first polymer..." (emphasis added). Thus, and in contrast to the position set forth in the Non-Final Office Action, the selection of the second polymer is not made by any of numerous means known to those skilled in the art, but is instead made by applying the specific criteria that are enumerated in each claim.

Second, for inherency to apply, the missing descriptive information must necessarily be present in the cited document such that one of skill in the art would recognize such a disclosure. "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill'" *(In re Robertson*, 49 USPQ2d 1949 (Fed.Cir. 1999) quoting *Continental Can Co. v. Monsanto Co.*, 20 USPQ2d 1746 (Fed.Cir. 1991)). In the excerpt quoted in the preceding page, the Examiner states, "The selection of the second polymer could be made by numerous means known to those of ordinary skill in the art." (emphasis added). However, inherency must be a necessary result, not merely a possible result. "'Inherency . . . may not be established by probabilities or possibilities. The mere fact that a

certain thing may result from a given set of circumstances is not sufficient.'" (*In re Robertson*, 49 USPQ2d 1949 (Fed. Cir. 1999) quoting *In re Oelrich*, 212 USPQ 323 (Fed.Cir. 1981). The Examiner has pointed to no method described in Hossainy *et al.* that would necessarily result in selecting one of the specified second polymers to be miscible with the specified first polymer and so that the components of the active agent delivery system have the additional one or more specific properties and/or relationships recited in Appellants' claims.

Third, Hossainy *et al.* describe a broad genus of possible combinations of polymers, of which the miscible polymer blends included in Appellants' method claims are a subgenus. M.P.E.P. §2131.02 states that a disclosed genus does not necessarily anticipate a species or subgenus of the disclosed genus. In *Akzo N.V. v. International Trade Comm'n*, 808 F.2d 1471, 1 USPQ2d 1241 (Fed.Cir. 1986), claims to a process for making aramid fibers using a 98% solution of sulfuric acid were not anticipated by a reference that disclosed using sulfuric acid solution but that did not disclose using a 98% concentrated sulfuric acid solution.

Appellants' claims are rejected as being inherently anticipated by the disclosure in Hossainy *et al.* of a genus of polymer combinations that is argued to encompass the miscible polymer blends that are a component of Appellants' method claims. The basis of the rejection is unclear because the rejection appears based on the disclosure in Hossainy *et al.* of certain polymer combinations even though Appellants' claims are directed to methods by which an active agent delivery system is formed. Nevertheless, even on the basis of the polymer combinations described in Hossainy *et al.*, the rejection is improper. As in *Azko*, the prior art document–Hossainy *et al.*–may describe a genus of polymer combinations that generally encompasses the miscible polymer blends described in Appellants' method claims, but Hossainy *et al.* fail to specify the subgenera of miscible polymer blends that include a member of the specified group of first polymers and at least one of the particular second polymers specified for each first polymer. Accordingly, Hossainy *et al.* fail to provide sufficient description of polymer combinations that would have placed the miscible polymer blends that are included in Appellants' claims in the possession of the public. Importantly, moreover, Appellants' claims

are drawn to methods that include selecting one of the specified second polymers according to specific criteria. Hossainy *et al.* provide no description of any method that includes selecting one of the particular second polymers specified in Appellants' claims based on the identity of the specified first polymer, its miscibility with the specified first polymer, or so that the components of the active agent delivery system have the particular one or more additional properties and/or relationships recited in Appellants' claims. Appellants' claims recite selecting one of the specified second polymers based all of these criteria. Thus, with respect to the methods specifically disclosed, Hossainy *et al.*, as in *Azko*, fail to provide description that places the Appellants' claimed subgenus of methods–i.e., selecting one of the specified second polymers based on the identity of the first polymer, its miscibility with the first polymer, and so that the components of the active agent delivery system have the specific one or more additional properties and/or relationships–in the possession of the public.

Hossainy *et al.* fail to teach, expressly or inherently, a method that includes forming a miscible polymer blend by the conscious, deliberate, and discretionary step of selecting a second polymer to be miscible with a first polymer or so that the components of the active agent delivery system have the specific one or more additional properties and/or relationships recited in Appellants' claims. Therefore, Hossainy *et al.* cannot anticipate Appellants' claims. Accordingly, Appellants submit that the rejection of claims 1-51 under 35 U.S.C. §102(b) as being anticipated by Hossainy *et al.* is improper and request that the rejection be reversed.

Claims 1-18 and 20-78 are not anticipated under 35 U.S.C. §102(b) by Whitbourne *et al.* (U.S. Patent No. 6,110,483)

Claims 1-18 and 20-78 stand rejected under 35 U.S.C. §102(b) as anticipated by Whitbourne *et al.*

As noted in the immediately preceding section, M.P.E.P. §2131 states, "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or

inherently described, in a single prior art reference." Appellants respectfully submit that Whitbourne *et al.* cannot anticipate claims 1-18 and 20-78 because Whitbourne *et al.* fail to set forth each and every feature recited in the claims.

Claims 1, 10, 20, 32, 44, 46, 48, 50, 52 to 56, 63, and 71 to 78 are independent. Each of the remaining claims depends, directly or indirectly, from one of the independent claims and, therefore, includes all of the features of the independent claim from which it depends.

The subject matter of Appellants' claims are discussed in detail above in connection with the rejection of claims 1-18 and 20-78 as being anticipated by Hossainy *et al.* Briefly, each independent claim includes forming an active agent delivery system that includes some variation of selecting a second polymer from a specified group of second polymers to be miscible with a specified first polymer identified elsewhere in the claim. In addition, forming the active agent delivery system includes selecting the components–e.g., the active agent, first polymer, and second polymer–to balance one or more of a plurality of additional properties of, and/or relationships between, the components in order to achieve the desired delivery character of the delivery system as a whole. Thus, the second polymers from which to choose are, in part, determined by the identity of the first polymer. In addition, the second polymer is selected based on one or more particular properties and/or relationships specified in each independent claim.

Whitbourne *et al.* teach coating liquids used for coating medical devices, methods of coating the devices, and the coated devices (Whitbourne *et al.*, Abstract). Whitbourne *et al.* teach that components of the coatings can be varied to control certain characteristics of the coating such as lubricity, stability, swelling, flexibility, adhesion, and resistance to removal by wet abrasion (Whitbourne *et al.*, column 9, lines 29-32). Whitbourne *et al.* neither expressly nor inherently teach varying the components of the coatings to control delivery of an active agent. Moreover, Whitbourne *et al.* neither expressly nor inherently teach selecting components of the coatings based on certain characteristics of the components themselves. Consequently, Whitbourne *et al.* neither expressly nor inherently teach Appellants' claimed invention, particularly selecting a second polymer based on its miscibility with the first polymer and so that

the components of the active agent delivery system have any of the other properties and/or relationships recited in Appellants' claims.

In contrast, the claimed methods include the express, intentional, and conscious selection of polymers based on miscibility and one or more of the other properties and/or relationships recited in Appellants' claims. The present claims recite a cognitive and discretionary step that was unknown and, therefore, impossible prior to Appellants' disclosure.

Whitbourne *et al.* merely recite lists of general classes of polymers (column 5, lines 13-35, and column 5, line 66 through column 6, line 27), some of the members of which could conceivably be miscible with other members of the recited classes under certain conditions. In contrast, Appellants' claims recite methods that include specifically selecting a second polymer, in part, to be miscible with the specified first polymer–i.e., selected based, in part, on it miscibility–and, further, so that the components of the active agent delivery system possess the one or more additional properties and/or relationships recited in Appellants' claims. In the absence of evidence that one of the specific polymer selection criteria described in Whitbourne *et al.* necessarily results in selection of miscible polymers and so that the components of the active agent delivery system possess at least one of the additional properties and/or relationships recited in Appellants' claims, Whitbourne *et al.* cannot anticipate Appellants' claims.

The Final Office Action mailed April 11, 2007 deems the remarks above unpersuasive, stating:

> The relevance of this assertion is unclear. Clearly Whitbourne teaches a method of forming a coating for biomedical devices, the coating can be comprised of the same polymer blend as [Appellants'] claimed invention, since the polymers are the same it is inherent they will have the same solubility parameters and the difference between the solubility parameters of the polymers will also be the same. It appears as though [Appellants] are claiming an unknown property...of an old combination. (Final Office Action, pages 3-4).

The relevance of Appellants' assertion is that Appellants' claims are directed to methods, but the Office Action rejects the claims based on the disclosure by Whitbourne *et al.* of

certain possible but unidentified compositions rather than any actual method disclosed by Whitbourne *et al.*

As noted above in connection with the rejection of claims 1-18 and 20-78 as being anticipated by Hossainy *et al.*, Appellants' claims are not directed to particular polymer blends, nor are Appellants claiming an unknown property of an old combination, as suggested in the Final Office Action. Rather, Appellants claim novel methods that include a specific selection process that is not described or suggested by Whitbourne *et al.*

As noted above, Whitbourne *et al.* merely teach general classes of polymers, with no direction for selecting particular combinations of polymers based on miscibility and the other properties and/or relationships recited in Appellants' claims.

In contrast, each of the claimed methods includes selecting a second polymer from among a specified group of polymers that is, in part, based on the identity of a first polymer. Each independent claim further recites that the second polymer is selected to be miscible with the first polymer. Finally, each of Appellants' claims further describes selecting a second polymer so that the components of the active agent delivery system possess one or more specific additional properties and/or relationships.

Thus, Whitbourne *et al.* fail to describe any method that anticipates Appellants' claimed methods and Whitbourne *et al.* fail to teach the particular subgenus combinations of polymers recited in Appellants' method claims.

The miscible polymer blend formed as directed in Appellants' claimed methods are useful for forming an active agent delivery system that is capable of tuning delivery of an active agent in a manner that was unknown prior to Appellants' disclosure. Because these qualities of the recited miscible polymer blends were unknown prior to Appellants' disclosure, the polymer selection process recited in Appellants' claims that is based on exploiting the previously unknown tunable active agent delivery qualities of miscible polymer blends prepared from the recited polymers was impossible. Therefore, Whitbourne *et al.* cannot possibly anticipate Appellants' method claims.

The Examiner's rejection appears to be based on a theory that Whitbourne *et al.* inherently teach combinations of polymers that encompass combination of polymers recited in Appellants' methods. The Examiner's reliance on inherency is misplaced for at least three reasons.

First, whether Whitbourne *et al.* teach similar coatings is irrelevant because Appellants' claims are not directed to the coatings themselves, but rather are directed to methods by which the coatings are formed. Appellants' claims recite the cognitive and discretionary step of selecting the second polymer to be miscible with the first polymer and so that the components of the active agent delivery system possess one or more particularly identified additional properties and/or relationships. This cognitive and discretionary portion of the polymer selection process is neither taught nor suggested in Whitbourne *et al.*

The Non-Final Office Action dated November 5, 2007 applies the same argument in rejecting claims 1-18 and 20-78 as anticipated by Whitbourne *et al.* as it does in rejecting claims 1-18 and 20-78 as anticipated by Hossainy *et al.* Namely, the Non-Final Office Action asserts that Appellants' claims do not recite selecting polymers based on their solubility parameters and that the selection of the second polymer could be made by numerous methods known to those skilled in the art (Non-Final Office Action, page 12-13).

Appellants disagree. The Examiner's characterization of Appellants' claims neglects features expressly recited in Appellants' claims. First, contrary to the position stated in the Non-Final Office Action, each of Appellants' claims recites selecting polymers based, in part, on the difference of their solubility parameters, not only with respect to each other, but also with respect to the active agent. Second, the second polymer is selected to be miscible with the first polymer. Indeed, Appellants' claim 1 recites, in part, "...a second polymer selected to be miscible with the first polymer..." (emphasis added). Thus, and in contrast to the position set forth in the Non-Final Office Action, the selection of the second polymer is not made by any of numerous means known to those skilled in the art, but is instead made by applying the specific criteria that are enumerated in each claim.

Second, for inherency to apply, the missing descriptive information must necessarily be present in the cited document such that one of skill in the art would recognize such a disclosure. The Examiner's rejection is based on the mere possibility of the claimed result rather than a result that necessarily follows from the disclosure of Whitbourne *et al.*: the Examiner states, "The selection of the second polymer could be made by numerous means known to those of ordinary skill in the art." (Non-Final Office Action, November 5, 2007, pages 12-13, emphasis added). However, inherency must be a necessary result, not merely a possible result. "'Inherency . . . may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.'" (*In re Robertson*, 49 USPQ2d 1949 (Fed.Cir. 1999) quoting *In re Oelrich*, 212 USPQ 323 (Fed.Cir. 1981). The Examiner has pointed to no method described in Whitbourne *et al.* that would necessarily result in selecting one of the specified second polymers to be miscible with the specified first polymer so that the components of the active agent delivery system have the one or more specific properties and/or relationships recited in Appellants' claims.

Third, Whitbourne *et al.* describe a broad genus of possible combinations of polymers, of which the miscible polymer blends included in Appellants' method claims are a subgenus. M.P.E.P. §2131.02 states that a disclosed genus does not necessarily anticipate a species or subgenus of the disclosed genus. In *Akzo N.V. v. International Trade Comm'n*, 808 F.2d 1471, 1 USPQ2d 1241 (Fed.Cir. 1986), claims to a process for making aramid fibers using a 98% solution of sulfuric acid were not anticipated by a reference that disclosed using sulfuric acid solution but that did not disclose using a 98% concentrated sulfuric acid solution.

Appellants' claims are rejected as being inherently anticipated by the disclosure in Whitbourne *et al.* of a genus of polymer combinations that is argued to encompass the miscible polymer blends that are a component of Appellants' method claims. The basis of the rejection is unclear because the rejection appears based on the disclosure in Whitbourne *et al.* of certain polymer combinations even though Appellants' claims are directed to methods by which an active agent delivery system is formed. Nevertheless, even on the basis of the polymer

combinations described in Whitbourne *et al.*, the rejection is improper. As in *Azko*, the prior art document–Whitbourne *et al.*–may describe a genus of polymer combinations that generally encompasses the miscible polymer blends described in Appellants' method claims, but Whitbourne *et al.* fail to specify the subgenera of miscible polymer blends that include a member of the specified group of first polymers and at least one of the particular second polymers specified for each first polymer. Accordingly, Whitbourne *et al.* fail to provide sufficient description of polymer combinations that would have placed the miscible polymer blends that are included in Appellants' claims in the possession of the public. Importantly, moreover, Appellants' claims are drawn to methods that include selecting one of the specified second polymers according to specific criteria. Whitbourne *et al.* provide no description of any method that includes selecting one of the particular second polymers specified in Appellants' claims based on the identity of the specified first polymer, its miscibility with the specified first polymer, or so that the components of the active agent delivery system have the particular one or more additional properties and/or relationships recited in Appellants' claims. Appellants' claims recite selecting one of the specified second polymers based all of these criteria. Thus, with respect to the methods specifically disclosed, Whitbourne *et al.*, as in *Azko*, fail to provide description that places the Appellants' claimed subgenus of methods–i.e., selecting one of the specified second polymers based on the identity of the first polymer, its miscibility with the first polymer, and so that the components of the active agent delivery system have the specific one or more additional properties and/or relationships–in the possession of the public.

Whitbourne *et al.* fail to teach, expressly or inherently, a method that includes forming a miscible polymer blend by the conscious, deliberate, and discretionary step of selecting a second polymer to be miscible with a first polymer or so that components of the active agent delivery system have the one or more specific properties and/or relationships recited in Appellants' claims. Therefore, Whitbourne *et al.* cannot anticipate claims 1-18 and 20-78. Consequently, Appellants submit that the rejection of claims 1-18 and 20-78 under 35 U.S.C.

§102(b) as being anticipated by Whitbourne *et al.* is improper and request that the rejection be reversed.

Claims 1-18 and 20-78 are not anticipated under 35 U.S.C. §102(e) by Sirhan *et al.* (U.S. Patent Application Publication No. US 2002/0082679 A1)

Claims 1-18 and 20-78 stand rejected under 35 U.S.C. §102(e) as being anticipated by Sirhan *et al.* (U.S. Patent Application Publication No. US 2002/0082679 A1).

As noted in each of the two immediately preceding sections, M.P.E.P. §2131 states, "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Appellants respectfully submit that Sirhan *et al.* cannot anticipate claims 1-18 and 20-78 because Sirhan *et al.* fail to set forth each and every feature recited in the claims.

Claims 1, 10, 20, 32, 44, 46, 48, 50, 52 to 56, 63, and 71 to 78 are independent. Each of the remaining claims depends, directly or indirectly, from one of the independent claims and, therefore, includes all of the features of the independent claim from which it depends.

The subject matter of Appellants' claims are discussed in detail above in connection with the rejection of claims 1-18 and 20-78 as being anticipated by Hossainy *et al.* Briefly, each independent claim includes forming an active agent delivery system that includes some variation of selecting a second polymer from a specified group of polymers to be miscible with a specified first polymer identified elsewhere in the claim. In addition, forming the active agent delivery system includes selecting the components–e.g., the active agent, first polymer, and second polymer–to balance one or more of a plurality of properties of, and/or relationships between, components in order to achieve the desired delivery character of the delivery system as a whole. Thus, the second polymers from which to choose are, in part, determined by the identity of the first polymer. In addition, the second polymer is selected based on one or particular properties and/or relationships specified in each independent claim.

Sirhan *et al.* teach luminal prosthetic devices that allow for controlled release of a therapeutic agent (Sirhan *et al.*, Abstract). The device can include a "rate-controlling element" for controlling the release of the therapeutic agent (*Id.*, paragraph [0117]). The rate-controlling element may be formed from synthetic or natural, non-polymeric, polymeric or metallic materials (*Id.*, paragraph [0118]). Suitable polymers are listed in paragraphs [0119] and [0120], including "mixtures, copolymers, and combinations thereof" for each set of polymers. *Id.* With respect to the subject matter of claims 1-18 and 20-78, Sirhan *et al.* provide even less relevant teaching than either of Hossainy *et al.* or Whitbourne *et al.* Sirhan *et al.* neither expressly nor inherently teach polymer blends, miscible polymer blends, or any rationale, generally, for selecting two or more polymers for a mixture, copolymer, or combination of polymers. More particularly, Sirhan *et al.* fail to expressly or inherently teach a method that includes selecting a second polymer to be miscible with a first polymer or selecting a second polymer so that components of the active agent delivery system possess one or more of the particular properties and/or relationships recited in Appellants' claims.

In contrast, the claimed methods include the express, intentional, and conscious selection of polymers based on miscibility and one or more of the other properties and/or relationships recited in Appellants' claims. The present claims recite a cognitive and discretionary step that was unknown and, therefore, impossible prior to Appellants' disclosure.

As with the rejections based on Hossainy *et al.* and Whitbourne *et al.*, the rejection is based on the recitation in Sirhan *et al.* of general classes of polymers, some of the members of which could conceivably be miscible with other members of the recited classes under certain conditions. The Non-Final Office Action mailed November 5, 2007 states:

> Regarding the selection of the first and second polymer and active ingredient based upon their solubility parameters..., Sirhan teaches the mixtures of the same polymers and active ingredients as [Appellants'] claimed invention, therefore it is inherent that the same polymers and actives will have the same solubility parameters. It appears as though [Appellants] are claiming a new and/or undiscovered property of an old composition. (Non-Final Office Action, page 3).

The rejection is again based on the disclosure of possible but unidentified compositions rather than pointing to any method described in Sirhan *et al.* that expressly or inherently teaches the subject matter that is actually claimed. Appellants are not claiming an unknown property of an old combination, as suggested in the Non-Final Office Action. Rather, Appellants claim novel methods that include a specific selection process that is not described or suggested by Sirhan *et al.*

The Examiner's rejection appears to be based on a theory that Sirhan *et al.* inherently teach combinations of polymers that encompass combination of polymers recited in Appellants' methods. The Examiner's reliance on inherency is misplaced for at least three reasons.

First, whether Sirhan *et al.* teach similar coatings is irrelevant because Appellants' claims are not directed to the coatings themselves, but rather are directed to methods by which the coatings are formed. Appellants' claims recite the cognitive and discretionary step of selecting the second polymer to be miscible with the first polymer and to so that the components of the active agent delivery system possess one or more particularly identified additional properties and/or relationships. This cognitive and discretionary portion of the polymer selection process is neither taught nor suggested in Sirhan *et al.*

Second, for inherency to apply, the missing descriptive information must necessarily be present in the cited document such that one of skill in the art would recognize such a disclosure. The Examiner's rejection is based on the mere possibility that the disclosure of Sirhan *et al.* could lead one skilled in the art to forming miscible polymer blends recited in Appellants' claims. However, inherency must be a necessary result, not merely a possible result. "'Inherency . . . may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.'" (*In re Robertson*, 49 USPQ2d 1949 (Fed.Cir. 1999) quoting *In re Oelrich*, 212 USPQ 323 (Fed.Cir. 1981). The Examiner has pointed to no method described in Sirhan *et al.* that would necessarily result in selecting one of the specified second polymers to be miscible with the specified first polymer or

so that the components of the active agent delivery system have the one or more specified properties and/or relationships recited in Appellants' claims.

Third, Sirhan *et al.* describe a broad genus of possible combinations of polymers, of which the miscible polymer blends included in Appellants' method claims are a subgenus. M.P.E.P. §2131.02 states that a disclosed genus does not necessarily anticipate a species or subgenus of the disclosed genus. In *Akzo N.V. v. International Trade Comm'n*, 808 F.2d 1471, 1 USPQ2d 1241 (Fed.Cir. 1986), claims to a process for making aramid fibers using a 98% solution of sulfuric acid were not anticipated by a reference that disclosed using sulfuric acid solution but that did not disclose using a 98% concentrated sulfuric acid solution.

Appellants' claims are rejected as being inherently anticipated by the disclosure in Sirhan *et al.* of a genus of polymer combinations that is argued to encompass the miscible polymer blends that are a component of Appellants' method claims. The basis of the rejection is unclear because the rejection appears based on the disclosure in Sirhan *et al.* of certain polymer combinations even though Appellants' claims are directed to methods by which an active agent delivery system is formed. Nevertheless, even on the basis of the polymer combinations described in Sirhan *et al.*, the rejection is improper. As in *Azko*, the prior art document–Sirhan *et al.*–may describe a genus of polymer combinations that generally encompasses the miscible polymer blends described in Appellants' method claims, but Sirhan *et al.* fail to specify the subgenera of miscible polymer blends that include a member of the specified group of first polymers and at least one of the particular second polymers specified for each first polymer. Accordingly, Sirhan *et al.* fail to provide sufficient description of polymer combinations that would have placed the miscible polymer blends that are included in Appellants' claims in the possession of the public. Importantly, moreover, Appellants' claims are drawn to methods that include selecting one of the specified second polymers according to specific criteria. Sirhan *et al.* provide no description of any method that includes selecting one of the particular second polymers specified in Appellants' claims based on the identity of the specified first polymer, its miscibility with the specified first polymer, or so that the components of the active agent

delivery system have the particular one or more additional properties and/or relationships recited in Appellants' claims. Appellants' claims recite selecting one of the specified second polymers based all of these criteria. Thus, with respect to the methods specifically disclosed, Sirhan *et al.*, as in *Azko*, fail to provide description that places the Appellants' claimed subgenus of methods–i.e., selecting one of the specified second polymers based on the identity of the first polymer, its miscibility with the first polymer, and so that the components of the active agent delivery system have the specific one or more additional properties and/or relationships–in the possession of the public.

Sirhan *et al.* fail to teach, expressly or inherently, a method that includes forming a miscible polymer blend by the conscious, deliberate, and discretionary step of selecting a second polymer to be miscible with a first polymer or so that components of the active agent delivery system have the one or more specific additional properties and/or relationships recited in Appellants' claims. Therefore, Sirhan *et al.* cannot anticipate claims 1-18 and 20-78. Consequently, Appellants submit that the rejection of claims 1-18 and 20-78 under 35 U.S.C. §102(b) as being anticipated by Sirhan *et al.* is improper and request that the rejection be reversed.

Claims 1-18 and 20-78 are patentable under 35 U.S.C. §103(a) over Hossainy *et al.* (U.S. Patent No. 6,153,252)

Claims 1-18 and 20-78 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Hossainy *et al.* (U.S. Patent No. 6,153,252).

M.P.E.P. §2143 states that in order to establish a *prima facie* case of obviousness, three basic criteria must be met:

> (i) there must be a suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings;
> (ii) there must be a reasonable expectation of success; and
> (iii) the prior art reference (or references when combined) must teach or suggest all the claim limitations.

Appellants respectfully submit that the Office Action fails to establish a *prima facie* case of obviousness because, at a minimum, Hossainy *et al.* fail to teach or suggest all of the features recited in claims 1-18 and 20-78. Also, Hossainy *et al.* fail to motivate one skilled in the art to practice the methods recited in claims 1-18 and 20-78. Finally, Hossainy *et al.* fail to provide one skilled in the art with a reasonable expectation of success practicing the methods recited in claims 1-18 and 20-78.

Hossainy *et al.* fail to teach or suggest all of the features recited in claims 1-18 and 20-78

Appellants submit that Hossainy *et al.* fail to set forth a *prima facie* case of obviousness for claims 1-18 and 20-78 because, at least, Hossainy et al. fail to teach or suggest each and every feature of the claims.

Claims 1, 10, 20, 32, 44, 46, 48, 50, 52 to 56, 63, and 71 to 78 are independent. Each of the remaining claims depends, directly or indirectly, from one of the independent claims and, therefore, includes all of the features of the independent claim from which it depends.

The subject matter of Appellants' claims are discussed in detail above in connection with the rejection of claims 1-18 and 20-78 as being anticipated by Hossainy *et al.* Briefly, each independent claim includes forming an active agent delivery system that includes some variation of selecting a second polymer from a specified group of polymers to be miscible with a specified first polymer identified elsewhere in the claim. In addition, forming the active agent delivery system includes selecting the components–e.g., the active agent, first polymer, and second polymer–to balance one or more of a plurality of properties of, and/or relationships between, components in order to achieve the desired delivery character of the delivery system as a whole. Thus, the second polymers from which to choose are, in part, determined by the identity of the first

polymer. In addition, the second polymer is selected based on one or particular properties and/or relationships specified in each independent claim.

The deficiencies of the teachings of Hossainy *et al.* are set forth above in connection with the rejection of claims 1-18 and 20-78 as being anticipated by Hossainy *et al.* Hossainy *et al.* fail to teach, expressly or inherently, a method that includes forming a miscible polymer blend by selecting a second polymer to be miscible with a first polymer and/or so that the components of the active agent delivery system possess the one or more specific properties and/or relationships recited in Appellants' claims. Moreover, while Hossainy *et al.* teach a variety of properties on which the selection of polymers can be based, Hossainy *et al.* fail to suggest that miscibility–or any of the other properties and/or relationships recited in Appellant's claims–is one of those properties. Consequently, Hossainy *et al.* neither teach nor suggest Appellants' claimed invention, particularly selecting a second polymer based on its miscibility with the first polymer and/or any of the other properties recited in Appellants' claims.

Because Hossainy *et al.* fail to teach or suggest a method that includes selecting a second polymer to be miscible with a first polymer or so that the components of the active agent delivery system possess the one or more specific properties and/or relationships recited in claims 1-18 and 20-78, Hossainy *et al.* fail to teach or suggest each and every feature recited in claims 1-18 and 20-78.

Hossainy *et al.* fail to motivate one skilled in the art to practice the methods recited in claims 1-18 and 20-78

Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so. *In re Kahn*, 441 F.3d 977, 986, 78 USPQ2d 1329, 1335 (Fed.Cir. 2006). The teaching, suggestion, or motivation must be found either explicitly or implicitly in the references themselves or in the knowledge generally

available to one of ordinary skill in the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." *In re Kotzab,* 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed.Cir. 2000). See M.P.E.P. §2143.01. In *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727; 167 L.Ed.2d 705; 82 USPQ2d 1385 (2007), the U.S. Supreme Court has acknowledged the utility of the "teaching, suggestion, motivation" inquiry when determining the obviousness of an invention by recognizing that the inquiry arose from "helpful insight" of the Court of Customs and Patent Appeals.

Appellants respectfully submit that no motivation exists, either explicitly or implicitly, in Hossainy *et al.*, in the nature of the problem of delivering an active agent, or in the knowledge or common sense of one skilled in the art to make and/or use a tunable active agent delivery system that includes a miscible polymer blend prepared by selecting a second polymer to be miscible with a first polymer and also so that components of the active agent delivery system possess the one or more particularly identified properties and/or relationships. Hossainy *et al.* provide no teaching or suggestion that one can tune delivery of an active agent by using an active agent delivery system formed from a miscible polymer blend prepared by selecting a second polymer to be miscible with a first polymer and so that the components of the resulting active agent delivery system possess the one or more specified properties and/or relationships. No evidence has been set forth that the general knowledge or common sense of those skilled in the art included the knowledge that one could tune delivery of an active agent using an active agent delivery system formed as recited in claims 1-18 and 20-78. Moreover, no evidence has been set forth that the general nature of tuning delivery of an active agent would have suggested to one skilled in the art that such tuning is possible using an active agent delivery system formed as recited in claims 1-18 and 20-78.

The Non-Final Office Action dated November 5, 2007 states:

> The Hossainy patent is silent on the solubility parameter value of the biocompatible polymeric films and the active agent. Even though Hossainy is silent on the solubility parameters of the polymers and active agents and using the parameters to select the polymers and actives that would be miscible with each other, it is still obvious that since Hossainy encompasses many of the same polymers and active agents as [Appellants'] currently claimed invention it meets these limitations since obviously the same components will have the same solubility parameters. (Non-Final Office Action, page 10).

Thus, the Examiner appears to argue that Appellants' claims are rendered obvious in light of Hossainy *et al.* merely because the miscible polymer blends included in Appellants' method claims include "many of the same polymers and active agents" encompassed by the general classes of polymers disclosed in Hossainy *et al.* Appellants respectfully disagree. First, it bears repeating that the Examiner is rejecting Appellants' claims based on the alleged inherent disclosure of certain polymers and polymer combinations in Hossainy *et al.*–the Examiner refers to "the same polymers and active agents as [Appellants'] currently claimed invention"–even though Appellants' claims are directed to methods. Second, the disclosure relied upon in Hossainy *et al.* is insufficient to establish a *prima facie* case of obviousness. The fact that a claimed species or subgenus is encompassed by a prior art genus is not sufficient by itself to establish a *prima facie* case of obviousness. *In re Baird*, 16 F.3d 380, 382, 29 USPQ2d 1550, 1552 (Fed.Cir. 1994). Hossainy *et al.* describe combining general classes of polymers, but do not teach or suggest the specific combinations of polymers recited in Appellants' claims. Moreover, Hossainy *et al.* are silent with respect to combining polymers based on their miscibility and/or the properties and relationships set forth in Appellants' claims. "Silence in a reference is hardly a proper substitute for an adequate disclosure of facts from which a conclusion of obviousness may justifiably follow." *In re Burt and Walter*, 148 USPQ 548, 553 (CCPA 1966).

The Non-Final Office Action dated November 5, 2007 repeats the assertion made in the Non-Final Office Action dated December 6, 2006 (page 7) and the Final Office Action dated April 11, 2007 (page 6) that Perez *et al.* demonstrate that it was understood in the art to use solubility parameters to predict whether two polymers would be miscible (Non-Final Office Action, November 5, 2007, page 10). As an initial matter, Appellants note that Perez *et al.* is not formally identified as a secondary reference in the instant rejection under 35 U.S.C. §103(a). Nevertheless, Appellants do not dispute that Perez *et al.* teach that it was understood how to determine whether two materials would be miscible with one another.

However, understanding how to determine whether two materials are miscible with one another becomes relevant only if one is first motivated to select materials to be miscible with one another. None of Hossainy *et al.*, Perez *et al.*, the general knowledge or common sense of one skilled in the art, or the general nature of tuning delivery of an active agent, whether alone or in combination with any of the others, suggests tuning delivery of an active agent using a miscible polymer blend prepared by selecting one of the specified second polymers to be miscible with the first polymer specified in a given claim. Therefore, Perez *et al.* fail to cure the deficiencies of Hossainy *et al.*

The Federal Circuit reasserted in *Princeton Biochemicals, Inc. v. Beckman Coulter, Inc.*, 411 F.3d 1332; 75 USPQ2d 1051 (2005), that 35 U.S.C. §103 specifically requires an assessment of the claimed invention "as a whole." This "as a whole" assessment of the invention requires a showing that an artisan of ordinary skill in the art at the time of invention, confronted by the same problems as the inventor and with no knowledge of the claimed invention, would have selected the various elements from the cited references and combined them in the claimed manner. In other words, 35 U.S.C. §103 requires some showing of motivation, before the invention itself, to make the new combination.

This "as a whole" instruction in 35 U.S.C. §103 prevents evaluation of the invention part by part, aided by the template of Appellants' disclosure. Without this important requirement, an obviousness assessment might reduce an invention into its component parts, then find a reference corresponding to each component. This type of assessment would import hindsight into the obviousness determination by using the invention as a roadmap to find its prior art components. The U.S. Supreme Court cautioned against such analysis in *KSR*, stating, "A factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning." (82 USPQ2d at 1397, citing *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1 (1966), warning against a "temptation to read into the prior art the teachings of the invention in issue" and instructing courts to "'guard against slipping into the use of hindsight'" (383 U.S., at 36, quoting *Monroe Auto Equipment Co. v. Heckthorn Mfg. & Supply Co.*, 332 F. 2d 406, 412 (CA6 1964))).

Since the Supreme Court's decision in *KSR*, the Federal Circuit has reaffirmed the *prima facie* obviousness test for the chemical arts in *Takeda Chemical Industries, Ltd. v. Alphapharm Pty., Lt.,* 83 USPQ2d 1169. The Federal Circuit stated that "[w]hile the *KSR* Court rejected a rigid application of the teaching, suggestion, or motivation ('TSM') test in an obviousness inquiry, the Court acknowledged the importance of identifying 'a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does'." *Id.* at 1174.

Appellants respectfully submit that none of Hossainy *et al.*, the general knowledge of one skilled in the art, or the very nature of the problem of tunable delivery of an active agent would have suggested preparing an active agent delivery system formed, in part, by selecting a second polymer to be miscible with a first polymer and so that the components of the active agent delivery system possess the specified properties and/or relationships recited in Appellants' claims. Consequently, one skilled in the art

would not have been motivated to modify the teaching of Hossainy *et al.* in a way that would have led to the methods of Appellants claims.

Hossainy *et al.* fail to provide one skilled in the art with a reasonable expectation of successfully practicing the methods recited in claims 1-18 and 20-78

Hossainy *et al.* provide no expectation that one skilled in the art could form a tunable active agent delivery system using a method that includes selecting a second polymer to be miscible with a first polymer and so that the components of the active agent delivery system possess the one or more particular properties and/or relationships recited in Appellants' claims. As noted above in connection with the rejection of claims 1-18 and 20-78 as being anticipated by Hossainy *et al.*, the document provides an extensive listing of considerations that can be used to select polymers for stent coatings. However, Hossainy *et al.* fail to teach or suggest that one can form a tunable active agent delivery system using a method based on selecting a second polymer to be miscible with a first polymer and the specified additional properties and relationships.

Hossainy *et al.* fail to establish a *prima facie* case of obviousness against claims 1-18 and 20-78

Hossainy *et al.* fail to teach or suggest all of the features recited in claims 1-18 and 20-78. Also, Hossainy *et al.* fail to motivate one skilled in the art to practice methods that include preparing a tunable active agent delivery system as recited in claims 1-18 and 20-78. Finally, Hossainy *et al.* fail to provide one skilled in the art with a reasonable expectation of success making and/or using a tunable active agent delivery system prepared as recited in claims 1-18 and 20-78. Therefore, Hossainy *et al.* fail to establish a *prima facie* case of obviousness against claims 1-18 and 20-78. Consequently, Appellants respectfully submit that the rejection of claims 1-18 and 20-78

under 35 U.S.C. §103(a) as being unpatentable over Hossainy *et al.* is improper and should be reversed.

Claims 1-18 and 20-78 are patentable under 35 U.S.C. §103(a) over Whitbourne *et al.* (U.S. Patent No. 6,110,483)

Claims 1-18 and 20-78 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Whitbourne *et al.* (U.S. Patent No. 6,110,483).

As noted in the immediately preceding section, M.P.E.P. §2143 states that in order to establish a *prima facie* case of obviousness, three basic criteria must be met:

> (i) there must be a suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings;
> (ii) there must be a reasonable expectation of success; and
> (iii) the prior art reference (or references when combined) must teach or suggest all the claim limitations.

Appellants respectfully submit that the Examiner has failed to establish a *prima facie* case of obviousness because, at a minimum, Whitbourne *et al.* fail to teach or suggest all of the features recited in the claims. Also, Whitbourne *et al.* fail to motivate one skilled in the art to practice the methods recited in claims 1-18 and 20-78. Finally, Whitbourne *et al.* fail to provide one skilled in the art with a reasonable expectation of success practicing the methods recited in claims 1-18 and 20-78.

Whitbourne *et al.* fail to teach or suggest all of the features recited in claims 1-18 and 20-78

Appellants submit that Whitbourne *et al.* fail to set forth a *prima facie* case of obviousness for claims 1-18 and 20-78 because, at a minimum, Whitbourne *et al.* fail to teach or suggest each and every feature of the claims.

Claims 1, 10, 20, 32, 44, 46, 48, 50, 52 to 56, 63, and 71 to 78 are independent. Each of the remaining claims depends, directly or indirectly, from one of

the independent claims and, therefore, includes all of the features of the independent claim from which it depends.

The subject matter of Appellants' claims are discussed in detail above in connection with the rejection of claims 1-18 and 20-78 as being anticipated by Whitbourne *et al.* Briefly, each independent claim includes forming an active agent delivery system that includes some variation of selecting a second polymer from a specified group of polymers to be miscible with a specified first polymer identified elsewhere in the claim. In addition, forming the active agent delivery system includes selecting the components–e.g., the active agent, first polymer, and second polymer–to balance one or more of a plurality of properties of, and/or relationships between, the components in order to achieve the desired delivery character of the delivery system as a whole. Thus, the second polymers from which to choose are, in part, determined by the identity of the first polymer. In addition, the second polymer is selected based on one or particular properties and/or relationships specified in each independent claim.

The deficiencies of the teachings of Whitbourne *et al.* are set forth above in connection with the rejection of claims 1-18 and 20-78 as being anticipated by Whitbourne *et al.* Briefly, Whitbourne *et al.* fail to teach, expressly or inherently, a method that includes forming a miscible polymer blend by selecting a second polymer to be miscible with a first polymer and so that the components of the resulting active agent delivery system have the one or more specific properties and/or relationships recited in Appellants' claims. While Whitbourne *et al.* teach that components of stent coatings can be varied to control lubricity, stability, swelling, flexibility, adhesion, and resistance to removal by wet abrasion, Whitbourne *et al.* fail to teach or suggest that components of stent coatings can be varied to tune delivery of an active agent. Moreover, Whitbourne *et al.* fail to teach or suggest, for example, a method that includes forming a miscible polymer blend by selecting a second polymer so that the components of the active agent

delivery system possess the one or more particular properties and/or relationships recited in Appellants' claims.

Because Whitbourne *et al.* fail to teach or suggest a method that includes forming a miscible polymer blend by selecting a second polymer to be miscible with a first polymer and so that the components of the active agent delivery system also possess the one or more additional properties and/or relationships recited in claims 1-18 and 20-78, Whitbourne *et al.* fail to teach or suggest each and every feature recited in claims 1-18 and 20-78.

Whitbourne *et al.* fail to motivate one skilled in the art to practice the methods recited in claims 1-18 and 20-78

Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so. *In re Kahn*, 441 F.3d 977, 986, 78 USPQ2d 1329, 1335 (Fed.Cir. 2006). The vitality of this obviousness test for the chemical arts even after *KSR* is discussed above in connection with the rejection of claims 1-18 and 20-78 as being unpatentable under 35 U.S.C. §103(a) over Hossainy *et al.*

Appellants respectfully submit that no motivation exists, either explicitly or implicitly, in Whitbourne *et al.*, in the nature of the problem of delivering an active agent, or in the knowledge or common sense of one skilled in the art to make and/or use a tunable active agent delivery system that includes a miscible polymer blend prepared by selecting a second polymer to be miscible with a first polymer and also so that the active agent delivery system possess the one or more specific properties and/or relationships. Whitbourne *et al.* provide no teaching or suggestion that one can tune delivery of an active agent by using an active agent delivery system formed from a miscible polymer blend prepared by selecting a second polymer to be miscible with a first polymer and so that the components of the resulting active agent delivery system possess the specified

properties and/or relationships. No evidence has been set forth that the general knowledge or common sense of those skilled in the art included the knowledge that one could tune delivery of an active agent using an active agent delivery system formed as recited in claims 1-18 and 20-78. Moreover, no evidence has been set forth that the general nature of tuning delivery of an active agent would have suggested to one skilled in the art that such tuning is possible using an active agent delivery system formed as recited in claims 1-18 and 20-78.

The Non-Final Office Action dated November 5, 2007 states:

> The Whitbourne patent is silent on the solubility parameter value of the biocompatible polymeric films and the active agent. Even though Whitbourne is silent on the solubility parameters of the polymers and active agents and using the parameters to select the polymers and actives that would be miscible with each other, it is still obvious that since Whitbourne encompasses many of the same polymers and active agents as [Appellants'] currently claimed invention it meets these limitations since obviously the same components will have the same solubility parameters. (Non-Final Office Action, page 11).

Thus, the Examiner appears to argue that Appellants' claims are rendered obvious in light of Whitbourne *et al.* merely because the miscible polymer blends included in Appellants' method claims include "many of the same polymers and active agents" encompassed by the general classes of polymers disclosed in Whitbourne *et al.* Appellants respectfully disagree. Again, the Examiner rejects Appellants' claims based on the alleged inherent disclosure of certain polymers and polymer combinations in the cited document (in this case, Whitbourne *et al.*)–the Examiner again refers to "the same polymers and active agents as [Appellants'] currently claimed invention"–even though Appellants' claims are directed to methods. Moreover, the disclosure relied upon in Whitbourne *et al.* is insufficient to establish a *prima facie* case of obviousness. The fact that a claimed species or subgenus is encompassed by a prior art genus is not sufficient by itself to establish a *prima facie* case of obviousness. *In re Baird*, 16 F.3d 380, 382, 29 USPQ2d 1550, 1552 (Fed.Cir. 1994). Whitbourne *et al.* describe combining general

classes of polymers, but do not teach or suggest the particular polymer combinations recited in Appellants' claims. Moreover, Whitbourne *et al.* are silent with respect to combining polymers based on their miscibility and/or the properties and relationships set forth in Appellants' claims. "Silence in a reference is hardly a proper substitute for an adequate disclosure of facts from which a conclusion of obviousness may justifiably follow." *In re Burt and Walter*, 148 USPQ 548, 553 (CCPA 1966).

The Non-Final Office Action dated November 5, 2007 again employs Perez *et al.* to assert that it was understood in the art to use solubility parameters to predict whether two polymers would be miscible (Non-Final Office Action, November 5, 2007, page 11). As with the use of Perez *et al.* above in connection with the rejection of claims 1-18 and 20-78 as being unpatentable under 35 U.S.C. §103(a) over Hossainy *et al.*, Perez *et al.* is not formally identified as a secondary reference in the instant rejection under 35 U.S.C. §103(a). Nevertheless, Appellants do not dispute that Perez *et al.* teach that it was understood how to determine whether two materials would be miscbile with one another.

However, understanding how to determine whether two materials are miscible with one another becomes relevant only if one is first motivated to select materials to be miscible with one another. None of Whitbourne *et al.*, Perez *et al.*, the general knowledge available to one skilled in the art, or the general nature of tuning delivery of an active agent, whether alone or in combination with any of the others, suggests tuning delivery of an active agent using a polymer blend prepared by selecting one of the specified second polymers to be miscible with the first polymer specified in a given claim.

Appellants respectfully submit that none of Whitbourne *et al.*, the general knowledge of one skilled in the art, or the very nature of the problem of tuning delivery of an active agent suggested preparing an active agent delivery system formed, in part, by selecting a second polymer to be miscible with a first polymer and so that the

components of the active agent delivery system possess the one or more additional properties and/or relationships recited in Appellants' claims. Consequently, one skilled in the art would not have been motivated to modify the teaching of Whitbourne *et al.* in a way that would lead one to the methods of Appellants' claims.

Whitbourne *et al.* fail to provide one skilled in the art with a reasonable expectation of successfully practicing the methods recited in claims 1-18 and 20-78

Whitbourne *et al.* provide no expectation that one skilled in the art could form a tunable active agent delivery system using a method that includes selecting a second polymer to be miscible with a first polymer and so that the components of the active agent delivery system possess the one or more particularly identified properties and/or relationships recited in Appellants' claims. As noted above in connection with the failure of Whitbourne *et al.* to teach or suggest all of the features of claims 1-18 and 20-78, while Whitbourne *et al.* identify properties of stent coatings that can be considered when selecting polymers for forming the stent coatings, they fail to teach or suggest that one can form a tunable active agent delivery system using a method based on selecting a second polymer to be miscible with a first polymer and the specified additional properties and relationships. Consequently, Whitbourne *et al.* fail to provide one skilled in the art with a reasonable expectation of being able to successfully practice the methods of claims 1-18 and 20-78.

Whitbourne *et al.* fail to establish a *prima facie* case of obviousness against claims 1-18 and 20-78

Whitbourne *et al.* fail to teach or suggest all of the features recited in claims 1-18 and 20-78. Also, Whitbourne *et al.* fail to motivate one skilled in the art to practice methods that include preparing a tunable active agent delivery system as recited in claims 1-18 and 20-78. Finally, Whitbourne *et al.* fail to provide one skilled in the art with a

reasonable expectation of success making and/or using a tunable active agent delivery system prepared as recited in claims 1-18 and 20-78. Therefore, Whitbourne *et al.* fail to establish a *prima facie* case of obviousness against claims 1-18 and 20-78. Consequently, Appellants respectfully submit that the rejection of claims 1-18 and 20-78 under 35 U.S.C. §103(a) as being unpatentable over Whitbourne *et al.* is improper and should be reversed.

Claims 1-18 and 20-78 are patentable under 35 U.S.C. § 103(a) over Sirhan *et al.* (U.S. Patent Application Publication No. US 2002/0082679 A1)

Claims 1-18 and 20-78 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Sirhan *et al.* (U.S. Patent Application Publication No. US 2002/0082679 A1).

As noted in each of the two immediately preceding sections, M.P.E.P. §2143 states that in order to establish a *prima facie* case of obviousness, three basic criteria must be met:

> (i) there must be a suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings;
> (ii) there must be a reasonable expectation of success; and
> (iii) the prior art reference (or references when combined) must teach or suggest all the claim limitations.

Appellants respectfully submit that the Examiner has failed to establish a *prima facie* case of obviousness because, at a minimum, Sirhan *et al.* fail to teach or suggest all of the features recited in the claims. Also, Sirhan *et al.* fail to motivate one skilled in the art to practice the methods recited in claims 1-18 and 20-78. Finally, Sirhan *et al.* fail to provide one skilled in the art with a reasonable expectation of success practicing the methods recited in claims 1-18 and 20-78.

Sirhan *et al.* fail to teach or suggest all of the features recited in claims 1-18 and 20-78

Appellants submit that Sirhan *et al.* fail to set forth a *prima facie* case of obviousness for claims 1-18 and 20-78 because, at a minimum, Sirhan *et al.* fail to teach or suggest each and every feature of the claims.

Claims 1, 10, 20, 32, 44, 46, 48, 50, 52 to 56, 63, and 71 to 78 are independent. Each of the remaining claims depends, directly or indirectly, from one of the independent claims and, therefore, includes all of the features of the independent claim from which it depends.

The subject matter of Appellants' claims are discussed in detail above in connection with the rejection of claims 1-18 and 20-78 as being anticipated by Hossainy *et al.* Briefly, each independent claim includes forming an active agent delivery system that includes some variation of selecting a second polymer from a specified group of polymers to be miscible with a specified first polymer identified elsewhere in the claim. In addition, forming the active agent delivery system includes selecting the components–e.g., the active agent, first polymer, and second polymer–to balance one or more of a plurality of properties of, and/or relationships between, components in order to achieve the desired delivery character of the delivery system as a whole. Thus, the second polymers from which to choose are, in part, determined by the identity of the first polymer. In addition, the second polymer is selected based on one or particular properties and/or relationships specified in each independent claim.

The deficiencies of the teachings of Sirhan *et al.* are set forth above in connection with the rejection of claims 1-18 and 20-78 as being anticipated by Sirhan *et al.* Briefly, Sirhan *et al.* neither expressly nor inherently teach polymer blends, miscible polymer blends, or any rationale, generally, for selecting two or more polymers for a mixture, copolymer, or combination of polymers. More particularly, Sirhan *et al.* fail to expressly or inherently teach a method that includes selecting a second polymer to be

miscible with a first polymer or selecting a second polymer so that components of the active agent delivery system have the one or more specific properties and/or relationships recited in Appellants' claims.

Because Sirhan *et al.* fail to teach or suggest a method that includes forming a miscible polymer blend by selecting a second polymer to be miscible and so that the components of the active agent delivery system possess the one or more specifically recited properties and/or relationships, Sirhan *et al.* fail to teach or suggest each and every feature recited in claims 1-18 and 20-78.

Sirhan *et al.* fail to motivate one skilled in the art to practice the methods recited in claims 1-18 and 20-78

Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so. *In re Kahn*, 441 F.3d 977, 986, 78 USPQ2d 1329, 1335 (Fed.Cir. 2006). The vitality of this obviousness test for the chemical arts even after *KSR* is discussed above in connection with the rejection of claims 1-18 and 20-78 as being unpatentable under 35 U.S.C. §103(a) over Hossainy *et al.*

Appellants respectfully submit that no motivation exists, either explicitly or implicitly, in Sirhan *et al.*, in the nature of the problem of delivering an active agent, or in the knowledge or common sense of one skilled in the art to make and/or use a tunable active agent delivery system that includes a miscible polymer blend prepared by selecting a second polymer to be miscible with a first polymer and also so that components of the active agent delivery system possess the specifically recited additional properties and/or relationships. Sirhan *et al.* provide no teaching or suggestion that one can tune delivery of an active agent by using an active agent delivery system formed from a miscible polymer blend prepared by selecting a second polymer to be miscible with a first polymer and so that the components of the resulting active agent delivery

system possess the specified properties and/or relationships. No evidence has been set forth that the general knowledge or common sense of those skilled in the art included the knowledge that one could tune delivery of an active agent using an active agent delivery system formed as recited in claims 1-18 and 20-78. Moreover, no evidence has been set forth that the general nature of tuning delivery of an active agent would have suggested to one skilled in the art that such tuning is possible using an active agent delivery system formed as recited in claims 1-18 and 20-78.

The Non-Final Office Action dated November 5, 2007 states:

> The Sirhan patent is silent on the solubility parameter value of the biocompatible polymeric films and the active agent. Even though Sirhan is silent on the solubility parameters of the polymers and active agents and using the parameters to select the polymers and actives that would be miscible with each other, it is still obvious that since Sirhan encompasses many of the same polymers and active agents as [Appellants'] currently claimed invention it meets these limitations since obviously the same components will have the same solubility parameters. (Non-Final Office Action, page 9).

Once again, the Examiner appears to argue that the mere fact that the miscible polymer blends recited in Appellants' claims include "many of the same polymers and active agents" as those described in the cited document (in this case, Sirhan *et al.*) renders Appellants' claims obvious in light of that document. Appellants respectfully disagree. Once again, the Examiner rejects Appellants' claims based on the alleged inherent disclosure of certain polymers and polymer combinations in the document even though Appellants' claims are directed to methods. Second, the disclosure relied upon in Sirhan *et al.* is insufficient to establish a *prima facie* case of obviousness. The fact that a claimed species or subgenus is encompassed by a prior art genus is not sufficient by itself to establish a *prima facie* case of obviousness. *In re Baird*, 16 F.3d 380, 382, 29 USPQ2d 1550, 1552 (Fed.Cir. 1994). Sirhan *et al.* describe general classes of polymers, but do not teach or suggest the particular polymer combinations specified in Appellants' claims. Moreover, Sirhan *et al.* are silent with

respect to combining polymers based on their miscibility and/or the other properties and/or relationships recited in Appellants' claims. "Silence in a reference is hardly a proper substitute for an adequate disclosure of facts from which a conclusion of obviousness may justifiably follow." *In re Burt and Walter*, 148 USPQ 548, 553 (CCPA 1966).

The Non-Final Office Action dated November 5, 2007 employs Perez *et al.* to assert that it was understood in the art to use solubility parameters to predict whether two polymers would be miscible (Non-Final Office Action, November 5, 2007, page 9). As with the use of Perez *et al.* above in connection with the rejection of claims 1-18 and 20-78 as being unpatentable under 35 U.S.C. §103(a) over either Hossainy *et al.* or Whitbourne *et al.*, Perez *et al.* is not formally identified as a secondary reference in the instant rejection under 35 U.S.C. §103(a).

However, understanding how to determine whether two materials are miscible with one another becomes relevant only if one is first motivated to select materials to be miscible with one another. None of Sirhan *et al.*, Perez *et al.*, the general knowledge or common sense of one skilled in the art, or the general nature of tuning delivery of an active agent, whether alone or in combination with any of the others, suggests tuning delivery of an active agent using a miscible polymer blend prepared from a one of the specified first polymers and one of the specified second polymers selected to be miscible with the specified first polymer. Therefore, Perez *et al.* fail to cure the deficiencies of Sirhan *et al.*

Appellants respectfully submit that none of Sirhan *et al.*, the general knowledge or common sense of one skilled in the art, or the very nature of the problem of tuning delivery of an active agent suggested preparing an active agent delivery system formed, in part, by selecting a second polymer as directed in Appellants' claims. Consequently, one skilled in the art would not have been motivated to modify the

teaching of Sirhan *et al.* in a way that would lead one to the methods of Appellants' claims.

Sirhan *et al.* fail to provide one skilled in the art with a reasonable expectation of successfully practicing the methods recited in claims 1-18 and 20-78

Sirhan *et al.* provide no expectation that one skilled in the art could form a tunable active agent delivery system using a method that includes selecting one of the specified second polymers to be miscible with a specified first polymer to form a miscible polymer blend and so that components of the active agent delivery system have one or more additional properties and/or relationships recited in Appellants' claims. As noted above in connection with the failure of Sirhan *et al.* to teach or suggest all of the features of claims 1-18 and 20-78, Sirhan *et al.* neither expressly nor inherently teach any rationale, generally, for selecting two or more polymers for a mixture, copolymer, or combination of polymers. More particularly, Sirhan *et al.* fail to teach or suggest a method that includes selecting a second polymer to be miscible with a first polymer. Sirhan *et al.* also fail to teach or suggest a method that includes selecting a second polymer and so that components of the active agent delivery system have the particularly identified properties and/or relationships recited in Appellants' claims.

Sirhan *et al.* fail to establish a *prima facie* case of obviousness against claims 1-18 and 20-78

Sirhan *et al.* fail to teach or suggest all of the features recited in claims 1-18 and 20-78. Also, Sirhan *et al.* fail to motivate one skilled in the art to practice methods that include preparing a tunable active agent delivery system as recited in claims 1-18 and 20-78. Finally, Sirhan *et al.* fail to provide one skilled in the art with a reasonable expectation of success making and/or using a tunable active agent delivery system prepared as recited in claims 1-18 and 20-78. Therefore, Sirhan *et al.* fail to establish a

prima facie case of obviousness against claims 1-18 and 20-78. Consequently, Appellants' respectfully submit that the rejection of claims 1-18 and 20-78 under 35 U.S.C. §103(a) as being unpatentable over Sirhan *et al.* is improper and should be reversed.

VIII. SUMMARY

For the foregoing reasons, Appellants respectfully requests that the Board review and reverse the rejection of claims 1-18 and 20-78, as discussed herein and that notification of the allowance of these claims be issued.

Respectfully submitted
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CERTIFICATE UNDER 37 CFR §1.10:
"Express Mail" mailing label number: EM 118968870 US Date of Deposit: March 28, 2008
The undersigned hereby certifies that this paper is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR §1.10 on the date indicated above and is addressed to **Mail Stop - Appeal Brief - Patents**, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

By: Deb Schurmann
Name: Deb Schurmann

CLAIMS APPENDIX
Serial No. 10/640,853
Docket No. 134.01930101

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1. A method of forming a tunable active agent delivery system having a target diffusivity, the method comprising:

providing a hydrophobic active agent having a solubility parameter and a molecular weight of no greater than about 1200 g/mol; and

combining the hydrophobic active agent with a miscible polymer blend that is capable of controlling delivery of the active agent and comprises:

a first miscible polymer having a solubility parameter, and

a second polymer selected to be miscible with the first polymer and having a solubility parameter, wherein:

the difference between the solubility parameter of the active agent and at least one solubility parameter of at least one of the polymers is no greater than about 10 $J^{1/2}/cm^{3/2}$, and the difference between at least one solubility parameter of each of the polymers is no greater than about 5 $J^{1/2}/cm^{3/2}$;

at least one polymer has an active agent diffusivity higher than the target diffusivity and at least one polymer has an active agent diffusivity lower than the target diffusivity;

the molar average solubility parameter of the blend is no greater than 25 $J^{1/2}/cm^{3/2}$; and

the swellability of the blend is no greater than 10% by volume;

and further wherein:

the miscible polymer blend comprises at least one hydrophobic cellulose derivative and at least one miscible polyvinyl homopolymer or copolymer selected from the group consisting of

a polyvinyl alkylate homopolymer or copolymer, a polyvinyl alkyl ether homopolymer or copolymer, a polyvinyl acetal homopolymer or copolymer, and combinations thereof; or

the miscible polymer blend comprises a polyurethane and a second miscible polymer that is not a hydrophobic cellulose ester; wherein the second miscible polymer is selected from the group consisting of a polycarbonate, a polysulfone, a polyurethane, a polyphenylene oxide, a polyimide, a polyamide, a polyester, a polyether, a polyketone, a polyepoxide, a styrene-acrylonitrile copolymer, a poly(vinyl ester), a poly(vinyl ether), a polyacrylate, a poly(methyl acrylate), a polymethacrylate, a poly(methyl methacrylate), and combinations thereof; or

the miscible polymer blend comprises a poly(ethylene-co-(meth)acrylate) and a second miscible polymer not including poly(ethylene vinyl acetate); wherein the second miscible polymer is selected from the group consisting of a poly(vinyl alkylate) homopolymer or copolymer, a poly(vinyl alkyl ether) homopolymer or copolymer, a poly(vinyl acetal) homopolymer or copolymer, a poly(alkyl and/or aryl methacrylate) homopolymer or copolymer, a poly(alkyl and/or aryl acrylate) homopolymer or copolymer, and combinations thereof.

2. The method of claim 1 wherein:

the miscible polymer blend does not include a blend of a hydrophobic cellulose derivative and a polyurethane or a polyvinyl pyrrolidone; and/or

the miscible polymer blend does not include a blend of a polyalkyl methacrylate and a polyethylene-co-vinyl acetate.

3. The method of claim 1 wherein the difference between at least one Tg of at least two of the polymers corresponds to a range of diffusivities that includes the target diffusivity.

4. The method of claim 1 wherein the active agent is incorporated within the miscible polymer blend.

5. The method of claim 1 wherein the miscible polymer blend initially provides a barrier for permeation of the active agent.

6. The method of claim 1 wherein the active agent is incorporated within an inner matrix.

7. The method of claim 1 wherein the miscible polymer blend includes at least one hydrophobic polymer.

8. The method of claim 1 wherein the difference between the solubility parameter of the active agent and at least one solubility parameter of at least one of the polymers is no greater than about 5 $J^{1/2}/cm^{3/2}$.

9. The method of claim 1 wherein the difference between at least one solubility parameter of each of at least two of the polymers is no greater than about 3 $J^{1/2}/cm^{3/2}$.

10. A method of forming a tunable active agent delivery system having a target diffusivity, the method comprising:

providing a hydrophilic active agent having a solubility parameter and a molecular weight of no greater than about 1200 g/mol; and

combining the hydrophilic active agent with a miscible polymer blend that is capable of controlling delivery of the active agent, and comprises:

a first miscible polymer having a solubility parameter, and

a second polymer selected to be miscible with the first polymer and having a solubility parameter, wherein:

the difference between the solubility parameter of the active agent and at least one solubility parameter of at least one of the polymers is no greater than about 10 $J^{1/2}/cm^{3/2}$, and the difference between at least one solubility parameter of each of at least two polymers is no greater than about 5 $J^{1/2}/cm^{3/2}$;

at least one polymer has an active agent diffusivity higher than the target diffusivity and at least one polymer has an active agent diffusivity lower than the target diffusivity;

the molar average solubility parameter of the blend is greater than 25 $J^{1/2}/cm^{3/2}$; and

the swellability of the blend is no greater than 10% by volume;

and further wherein:

the miscible polymer blend comprises miscible polymers selected from the group consisting of polyacrylonitriles, cyanoacrylates, methacrylonitriles, hydrophilic cellulosics, and combinations thereof; or

the miscible polymer blend comprises a polyurethane and at least one miscible hydrophilic polymer selected from the group consisting of a polyurethane, a polyvinyl alcohol, a poly(alkylene ether), a polyvinyl pyridine, a polyvinyl pyrrolidone, a polyacrylonitrile, a polyacrylamide, a polyvinyl pyrrolidone/polyvinyl acetate copolymer, a sulfonated polystyrene, a polyvinyl pyrrolidone/polystyrene copolymer, a polysaccharide, a xanthan, a hydrophilic cellulose derivative, a hyaluronic acid, a hydrophilic polyacrylate, a hydrophilic polymethacrylate, a DNA or analog thereof, an RNA or analog thereof, heparin, a chitosan, a polyethylene imine, a polyacrylamide, an amine-containing polymer, and combinations thereof; or

the miscible polymer blend comprises two hydrophobic polyurethanes as a cap coat in a reservoir system.

11. The method of claim 10 wherein the miscible polymer blend does not include both a hydrophobic cellulose derivative and a polyvinyl pyrrolidone.

12. The method of claim 10 wherein the difference between at least one Tg of at least two of the polymers corresponds to a range of diffusivities that includes the target diffusivity.

13. The method of claim 10 wherein the active agent is incorporated within the miscible polymer blend.

14. The method of claim 10 wherein the miscible polymer blend initially provides a barrier for permeation of the active agent.

15. The method of claim 14 wherein the active agent is incorporated within an inner matrix.

16. The method of claim 10 wherein the miscible polymer blend includes at least one hydrophilic polymer.

17. The method of claim 10 wherein the difference between the solubility parameter of the active agent and at least one solubility parameter of at least one of the polymers is no greater than about 5 $J^{1/2}/cm^{3/2}$.

18. The method of claim 10 wherein the difference between at least one solubility parameter of each of at least two of the polymers is no greater than about 3 $J^{1/2}/cm^{3/2}$.

20. A method of forming a tunable active agent delivery system having a target diffusivity, the method comprising:

providing a hydrophobic active agent having a solubility parameter and a molecular weight of greater than about 1200 g/mol; and

combining the hydrophobic active agent with a miscible polymer blend that is capable of controlling delivery of the active agent and comprises:

a first miscible polymer having a solubility parameter, and

a second polymer selected to be miscible with the first polymer and having a solubility parameter, wherein:

the difference between the solubility parameter of the active agent and at least one solubility parameter of at least one of the polymers is no greater than about 10 $J^{1/2}/cm^{3/2}$, and the difference between at least one solubility parameter of each of at least two polymers is no greater than about 5 $J^{1/2}/cm^{3/2}$;

at least one polymer has an active agent diffusivity higher than the target diffusivity and at least one polymer has an active agent diffusivity lower than the target diffusivity;

the molar average solubility parameter of the blend is no greater than 25 $J^{1/2}/cm^{3/2}$; and

the swellability of the blend is greater than 10% by volume;

and further wherein:

the miscible polymer blend comprises at least one hydrophobic cellulose derivative and at least one miscible polymer selected from the group consisting of polyethylene, polypropylene, polyisobutylene, polystyrene, poly(vinyl chloride), poly(vinyl bromide), poly(vinylidene chloride), poly(tetrafluoroethylene), poly(chloro trifluoroethylene), poly(vinyl alcohol), poly(vinyl acetate), poly(vinyl propionate), poly(methyl acylate), poly(ethyl acrylate), poly(propyl acrylate),

poly(butyl acrylate), poly(isobutyl acrylate), poly(2,2,3,3,4,4,4-heptafluorobutyl acrylate), poly(methyl methacrylate), poly(ethyl methacrylate), poly(butyl methacrylate), poly(isobutyl methacrylate), poly(tert-butyl methacrylate), poly(benzyl methacrylate), poly(ethoxyethyl methacrylate), polyacrylonitrile, polymethacrylonitrile, poly(alpha-cyanomethyl acrylate), polybutadiene, polyisoprene, polychloroprene, polyformaldehyde, poly(tetramethylene oxide), poly(propylene oxide), polyepichlorohydrin, poly(ethylene sulphide), poly(styrene sulphide), poly(ethylene terephthalate), poly(8-aminocaprylic acid), poly(hexamethylene adipamide), polyurethane hard segment (MDI + BDO), poly(bisphenyl A carbonate), cellulose acetate butyrate, phenoxy, poly(vinyl pyrrolidone), poly(vinyl pyrrolidone)-co-poly(vinyl acetate), poly(ethylene oxide), and combinations thereof.

21. The method of claim 20 wherein:

the miscible polymer blend does not include a blend of a hydrophobic cellulose derivative and a polyurethane or a polyvinyl pyrrolidone; and/or

the miscible polymer blend does not include a blend of a polyalkyl methacrylate and a polyethylene-co-vinyl acetate.

22. The method of claim 20 wherein the difference between the swellabilities of at least two of the polymers corresponds to a range of diffusivities that includes the target diffusivity.

23. The method of claim 20 wherein the active agent is incorporated within the miscible polymer blend.

24. The method of claim 20 wherein the miscible polymer blend initially provides a barrier for permeation of the active agent.

25. The method of claim 24 wherein the active agent is incorporated within an inner matrix.

26. The method of claim 20 wherein the second polymer of the miscible polymer blend is a hydrophobic polymer.

27. The method of claim 26 wherein the miscible polymer blend includes a second polymer that is hydrophilic.

28. The method of claim 27 wherein the hydrophilic polymer is a hydrophilic polyurethane.

29. The method of claim 20 wherein the difference between the solubility parameter of the active agent and at least one solubility parameter of at least one of the polymers is no greater than about 5 $J^{1/2}/cm^{3/2}$.

30. The method of claim 20 wherein the difference between at least one solubility parameter of each of at least two of the polymers is no greater than about 3 $J^{1/2}/cm^{3/2}$.

31. The method of claim 20 wherein the active agent is not heparin.

32. A method of forming a tunable active agent delivery system having a target diffusivity, the method comprising:

providing a hydrophilic active agent having a solubility parameter and a molecular weight of greater than about 1200 g/mol; and

combining the hydrophilic active agent with a miscible polymer blend that is capable of controlling delivery of the active agent, and comprises:

a first miscible polymer having a solubility parameter, and

a second polymer selected to be miscible with the first polymer and having a solubility parameter, wherein:

the difference between the solubility parameter of the active agent and at least one solubility parameter of at least one of the polymers is no greater than about 10 $J^{1/2}/cm^{3/2}$, and the difference between at least one solubility parameter of each of at least two polymers is no greater than about 5 $J^{1/2}/cm^{3/2}$;

at least one polymer has an active agent diffusivity higher than the target diffusivity and at least one polymer has an active agent diffusivity lower than the target diffusivity;

the molar average solubility parameter of the blend is greater than 25 $J^{1/2}/cm^{3/2}$; and

the swellability of the blend is greater than 10% by volume;

and further wherein:

the miscible polymer blend comprises at least one hydrophilic polymer and a second miscible polymer that is hydrophilic or hydrophobic; wherein the hydrophilic polymer is selected from the group consisting of a polyurethane, a polyvinyl alcohol, a poly(alkylene ether), a polyvinyl pyridine, a polyvinyl pyrrolidone, a polyacrylonitrile, a polyacrylamide, a polyvinyl pyrrolidone/polyvinyl acetate copolymer, a sulfonated polystyrene, a polyvinyl pyrrolidone/polystyrene copolymer, a polysaccharide, a xanthan, a hydrophilic cellulose derivative, a hyaluronic acid, a hydrophilic polyacrylate, a hydrophilic polymethacrylate, a DNA or analog thereof, an RNA or analog thereof, heparin, a chitosan, a polyethylene imine, a polyacrylamide, an amine-containing polymer, and combinations thereof; and the hydrophobic polymer is selected from the group consisting of a polyurethane, a polycarbonate, a polysulfone, a polyphenylene osied, a polyimide, a polyamide, a polyester, a polyether, a polyketone, a polyepoxide, a styrene-acrylonitrile copolymer, a polyvinyl alkylate, a polyvinyl alkyl ether, a polyvinyl acetal, a hydrophobic cellulose derivative, and combinations thereof.

33. The method of claim 32 wherein the miscible polymer blend does not include both a hydrophobic cellulose derivative and a polyvinyl pyrrolidone.

34. The method of claim 32 wherein the difference between the swellabilities of at least two of the polymers corresponds to a range of diffusivities that includes the target diffusivity.

35. The method of claim 32 wherein the active agent is incorporated within the miscible polymer blend.

36. The method of claim 32 wherein the miscible polymer blend initially provides a barrier for permeation of the active agent.

37. The method of claim 36 wherein the active agent is incorporated within an inner matrix.

38. The method of claim 32 wherein the miscible polymer blend includes at least one hydrophilic polymer.

39. The method of claim 38 wherein one polymer is a hydrophilic polyurethane.

40. The method of claim 38 wherein the miscible polymer blend includes a second polymer that is hydrophobic.

41. The method of claim 32 wherein the difference between the solubility parameter of the active agent and at least one solubility parameter of at least one of the polymers is no greater than about 5 $J^{1/2}/cm^{3/2}$.

42. The method of claim 32 wherein the difference between at least one solubility parameter of each of at least two of the polymers is no greater than about 3 $J^{1/2}/cm^{3/2}$.

43. The method of claim 32 wherein the active agent is not heparin.

44. A method of making a medical device comprising;

providing a medical device comprising a surface; and

adhering an active agent delivery system formed by the method of claim 1 to at least a portion of the surface.

45. The method of claim 44 selected from the group consisting of a stent, stent graft, anastomotic connector, lead, needle, guide wire, catheter, sensor, surgical instrument, angioplasty balloon, wound drain, shunt, tubing, urethral insert, pellet, implant, blood oxygenator, pump, vascular graft, valve, pacemaker, orthopedic device, replacement device for nucleus pulposus, and intraocular lense.

46. A method of making a medical device comprising;

providing a medical device comprising a surface; and

adhering an active agent delivery system formed by the method of claim 10 to at least a portion of the surface.

47. The method of claim 46 selected from the group consisting of a stent, stent graft, anastomotic connector, lead, needle, guide wire, catheter, sensor, surgical instrument, angioplasty balloon, wound drain, shunt, tubing, urethral insert, pellet, implant, blood

oxygenator, pump, vascular graft, valve, pacemaker, orthopedic device, replacement device for nucleus pulposus, and intraocular lense.

48. A method of making a medical device comprising;

providing a medical device comprising a surface; and

adhering an active agent delivery system formed by the method of claim 20 to at least a portion of the surface.

49. The method of claim 48 selected from the group consisting of a stent, stent graft, anastomotic connector, lead, needle, guide wire, catheter, sensor, surgical instrument, angioplasty balloon, wound drain, shunt, tubing, urethral insert, pellet, implant, blood oxygenator, pump, vascular graft, valve, pacemaker, orthopedic device, replacement device for nucleus pulposus, and intraocular lense.

50. A method of making a medical device comprising;

providing a medical device comprising a surface; and

adhering an active agent delivery system formed by the method of claim 32 to at least a portion of the surface.

51. The method of claim 50 selected from the group consisting of a stent, stent graft, anastomotic connector, lead, needle, guide wire, catheter, sensor, surgical instrument, angioplasty balloon, wound drain, shunt, tubing, urethral insert, pellet, implant, blood

oxygenator, pump, vascular graft, valve, pacemaker, orthopedic device, replacement device for nucleus pulposus, and intraocular lense.

52. A method of making a stent comprising;

providing a stent comprising a surface; and

adhering an active agent delivery system formed by the method of claim 1 to at least a portion of the surface.

53. A method of making a stent comprising;

providing a stent comprising a surface; and

adhering an active agent delivery system formed by the method of claim 10 to at least a portion of the surface.

54. A method of making a stent comprising;

providing a stent comprising a surface; and

adhering an active agent delivery system formed by the method of claim 20 to at least a portion of the surface.

55. A method of making a stent comprising;

providing a stent comprising a surface; and

adhering an active agent delivery system formed by the method of claim 32 to at least a portion of the surface.

56. A method of designing an active agent delivery system for delivering an active agent over a preselected dissolution time (t) through a preselected critical dimension (x) of a miscible polymer blend that controls delivery of the active agent, the method comprising:

providing an active agent having a solubility parameter and a molecular weight no greater than about 1200 g/mol;

providing a first miscible polymer having a solubility parameter;

selecting a second polymer to be miscible with the first polymer and having a solubility parameter, wherein:

the difference between the solubility parameter of the active agent and at least one solubility parameter of each of the polymers is no greater than about 10 $J^{1/2}/cm^{3/2}$, and the difference between at least one solubility parameter of each of the polymers is no greater than about 5 $J^{1/2}/cm^{3/2}$;

the difference between at least one Tg of each of the polymers is sufficient to include the target diffusivity; combining the polymers to form a miscible polymer blend; and

combining the miscible polymer blend with the active agent to form an active agent delivery system having the preselected dissolution time through a preselected critical dimension of the miscible polymer blend;

wherein:

the miscible polymer blend comprises at least one hydrophobic cellulose derivative and at least one miscible polyvinyl homopolymer or copolymer selected from the group consisting of

a polyvinyl alkylate homopolymer or copolymer, a polyvinyl alkyl ether homopolymer or copolymer, a polyvinyl acetal homopolymer or copolymer, and combinations thereof; or

the miscible polymer blend comprises a polyurethane and a second miscible polymer that is not a hydrophobic cellulose ester; wherein the second miscible polymer is selected from the group consisting of a polycarbonate, a polysulfone, a polyurethane, a polyphenylene oxide, a polyimide, a polyamide, a polyester, a polyether, a polyketone, a polyepoxide, a styrene-acrylonitrile copolymer, a poly(vinyl ester), a poly(vinyl ether), a polyacrylate, a poly(methyl acrylate), a polymethacrylate, a poly(methyl methacrylate), and combinations thereof; or

the miscible polymer blend comprises a poly(ethylene-co-(meth)acrylate) and a second miscible polymer not including poly(ethylene vinyl acetate); wherein the second miscible polymer is selected from the group consisting of a poly(vinyl alkylate) homopolymer or copolymer, a poly(vinyl alkyl ether) homopolymer or copolymer, a poly(vinyl acetal) homopolymer or copolymer, a poly(alkyl and/or aryl methacrylate) homopolymer or copolymer, a poly(alkyl and/or aryl acrylate) homopolymer or copolymer, and combinations thereof; or

the miscible polymer blend comprises miscible polymers selected from the group consisting of polyacrylonitriles, cyanoacrylates, methacrylonitriles, hydrophilic cellulosics, and combinations thereof; or

the miscible polymer blend comprises a polyurethane and at least one miscible hydrophilic polymer selected from the group consisting of a polyurethane, a polyvinyl alcohol, a poly(alkylene ether), a polyvinyl pyridine, a polyvinyl pyrrolidone, a polyacrylonitrile, a polyacrylamide, a polyvinyl pyrrolidone/polyvinyl acetate

copolymer, a sulfonated polystyrene, a polyvinyl pyrrolidone/polystyrene copolymer, a polysaccharide, a xanthan, a hydrophilic cellulose derivative, a hyaluronic acid, a hydrophilic polyacrylate, a hydrophilic polymethacrylate, a DNA or analog thereof, an RNA or analog thereof, heparin, a chitosan, a polyethylene imine, a polyacrylamide, an amine-containing polymer, and combinations thereof; or

the miscible polymer blend comprises two hydrophobic polyurethanes as a cap coat in a reservoir system.

57. The method of claim 56 wherein the active agent is incorporated within the miscible polymer blend.

58. The method of claim 56 wherein miscible polymer blend initially provides a barrier for permeation of the active agent.

59. The method of claim 56 wherein the active agent is incorporated within an inner matrix.

60. The method of claim 56 wherein the active agent is hydrophobic.

61. The method of claim 56 wherein the active agent is hydrophilic.

62. The method of claim 56 wherein:

the miscible polymer blend does not include a blend of a hydrophobic cellulose

derivative and a polyurethane or a polyvinyl pyrrolidone; and/or

the miscible polymer blend does not include a blend of a polyalkyl methacrylate and a polyethylene-co-vinyl acetate.

63. A method of designing an active agent delivery system for delivering an active agent over a preselected dissolution time (t) through a preselected critical dimension (x) of a miscible polymer blend that controls delivery of the active agent, the method comprising:

providing an active agent having a solubility parameter and a molecular weight greater than about 1200 g/mol;

providing a first miscible polymer having a solubility parameter;

selecting a second polymer to be miscible with the first polymer and having a solubility parameter, wherein:

the difference between the solubility parameter of the active agent and at least one solubility parameter of each of the polymers is no greater than about 10 $J^{1/2}/cm^{3/2}$, and the difference between at least one solubility parameter of each of the polymers is no greater than about 5 $J^{1/2}/cm^{3/2}$;

the difference between the swellabilities of the polymers is sufficient to include the target diffusivity;

combining the polymers to form a miscible polymer blend; and

combining the miscible polymer blend with the active agent to form an active agent delivery system having the preselected dissolution time through a preselected critical dimension of the miscible polymer blend;

wherein:

the miscible polymer blend comprises at least one hydrophobic cellulose derivative and a second polymer selected from the group consisting of polyethylene, polypropylene, polyisobutylene, polystyrene, poly(vinyl chloride), poly(vinyl bromide), poly(vinylidene chloride), poly(tetrafluoroethylene), poly(chloro trifluoroethylene), poly(vinyl alcohol), poly(vinyl acetate), poly(vinyl propionate), poly(methyl acylate), poly(ethyl acrylate), poly(propyl acrylate), poly(butyl acrylate), poly(isobutyl acrylate), poly(2,2,3,3,4,4,4-heptafluorobutyl acrylate), poly(methyl methacrylate), poly(ethyl methacrylate), poly(butyl methacrylate), poly(isobutyl methacrylate), poly(tert-butyl methacrylate), poly(benzyl methacrylate), poly(ethoxyethyl methacrylate), polyacrylonitrile, polymethacrylonitrile, poly(alpha-cyanomethyl acrylate), polybutadiene, polyisoprene, polychloroprene, polyformaldehyde, poly(tetramethylene oxide), poly(propylene oxide), polyepichlorohydrin, poly(ethylene sulphide), poly(styrene sulphide), poly(ethylene terephthalate), poly(8-aminocaprylic acid), poly(hexamethylene adipamide), polyurethane hard segment (MDI + BDO), poly(bisphenyl A carbonate), cellulose acetate butyrate, phenoxy, poly(vinyl pyrrolidone), poly(vinyl pyrrolidone)-co-poly(vinyl acetate), poly(ethylene oxide), and combinations thereof; or

the miscible polymer blend comprises at least one hydrophilic polymer and a second miscible polymer that is hydrophilic or hydrophobic; wherein the hydrophilic polymer is selected from the group consisting of a polyurethane, a polyvinyl alcohol, a poly(alkylene ether), a polyvinyl pyridine, a polyvinyl pyrrolidone, a polyacrylonitrile, a

polyacrylamide, a polyvinyl pyrrolidone/polyvinyl acetate copolymer, a sulfonated polystyrene, a polyvinyl pyrrolidone/polystyrene copolymer, a polysaccharide, a xanthan, a hydrophilic cellulose derivative, a hyaluronic acid, a hydrophilic polyacrylate, a hydrophilic polymethacrylate, a DNA or analog thereof, an RNA or analog thereof, heparin, a chitosan, a polyethylene imine, a polyacrylamide, an amine-containing polymer, and combinations thereof; and the hydrophobic polymer is selected from the group consisting of a polyurethane, a polycarbonate, a polysulfone, a polyphenylene osied, a polyimide, a polyamide, a polyester, a polyether, a polyketone, a polyepoxide, a styrene-acrylonitrile copolymer, a polyvinyl alkylate, a polyvinyl alkyl ether, a polyvinyl acetal, a hydrophobic cellulose derivative, and combinations thereof.

64. The method of claim 63 wherein the active agent is incorporated within the miscible polymer blend.

65. The method of claim 63 wherein miscible polymer blend initially provides a barrier for permeation of the active agent.

66. The method of claim 63 wherein the active agent is incorporated within an inner matrix.

67. The method of claim 63 wherein the active agent is hydrophobic.

68. The method of claim 63 wherein the active agent is hydrophilic.

69. The method of claim 63 wherein the active agent is not heparin.

70. The method of claim 63 wherein:

the miscible polymer blend does not include a blend of a hydrophobic cellulose derivative and a polyurethane or a polyvinyl pyrrolidone; and/or

the miscible polymer blend does not include a blend of a polyalkyl methacrylate and a polyethylene-co-vinyl acetate.

71. A method for delivering an active agent to a subject, the method comprising:
providing the active agent delivery system formed according to the method of claim 1; and

contacting the active agent delivery system with a bodily fluid, organ, or tissue of a subject.

72. A method for delivering an active agent to a subject, the method comprising:
providing the active agent delivery system formed according to the method of claim 10; and

contacting the active agent delivery system with a bodily fluid, organ, or tissue of a subject.

73. A method for delivering an active agent to a subject, the method comprising:
providing the active agent delivery system formed according to the method of claim 20; and

contacting the active agent delivery system with a bodily fluid, organ, or tissue of a subject.

74. A method for delivering an active agent to a subject, the method comprising: providing the active agent delivery system formed according to the method of claim 32; and

contacting the active agent delivery system with a bodily fluid, organ, or tissue of a subject.

75. A method for tuning the delivery of an active agent to a subject, the method comprising: providing an active agent delivery system comprising an active agent having a molecular weight no greater than about 1200 g/mol and a miscible polymer blend, comprising:

providing a first miscible polymer having a solubility parameter;

selecting a second polymer to be miscible with the first polymer and having a solubility parameter;

combining the first polymer and the second polymer to form a miscible polymer blend that controls the delivery of the active agent; wherein the difference between the solubility parameter of the active agent and at least one solubility parameter of each of the polymers is no greater than about 10 $J^{1/2}/cm^{3/2}$, and the difference between at least one solubility parameter of each of the polymers is no greater than about 5 $J^{1/2}/cm^{3/2}$; and

combining the miscible polymers and an active agent in amounts sufficient to form the active agent delivery system comprising a miscible polymer blend capable of delivering an active agent at a predetermined release rate; and

contacting the active agent delivery system with a bodily fluid, organ, or tissue of a subject to deliver the active agent at the predetermined release rate;

wherein:

the miscible polymer blend comprises at least one hydrophobic cellulose derivative and at least one miscible polyvinyl homopolymer or copolymer selected from the group consisting of a polyvinyl alkylate homopolymer or copolymer, a polyvinyl alkyl ether homopolymer or copolymer, a polyvinyl acetal homopolymer or copolymer, and combinations thereof; or

the miscible polymer blend comprises a polyurethane and a second miscible polymer that is not a hydrophobic cellulose ester; wherein the second miscible polymer is selected from the group consisting of a polycarbonate, a polysulfone, a polyurethane, a polyphenylene oxide, a polyimide, a polyamide, a polyester, a polyether, a polyketone, a polyepoxide, a styrene-acrylonitrile copolymer, a poly(vinyl ester), a poly(vinyl ether), a polyacrylate, a poly(methyl acrylate), a polymethacrylate, a poly(methyl methacrylate), and combinations thereof; or

the miscible polymer blend comprises a poly(ethylene-co-(meth)acrylate) and a second miscible polymer not including poly(ethylene vinyl acetate); wherein the second miscible polymer is selected from the group consisting of a poly(vinyl alkylate) homopolymer or copolymer, a poly(vinyl alkyl ether) homopolymer or copolymer, a poly(vinyl acetal) homopolymer or copolymer, a poly(alkyl and/or aryl methacrylate) homopolymer or copolymer, a poly(alkyl and/or aryl acrylate) homopolymer or copolymer, and combinations thereof; or

the miscible polymer blend comprises miscible polymers selected from the group consisting of polyacrylonitriles, cyanoacrylates, methacrylonitriles, hydrophilic cellulosics, and combinations thereof; or

the miscible polymer blend comprises a polyurethane and at least one miscible hydrophilic polymer selected from the group consisting of a polyurethane, a polyvinyl alcohol, a poly(alkylene ether), a polyvinyl pyridine, a polyvinyl pyrrolidone, a polyacrylonitrile, a

polyacrylamide, a polyvinyl pyrrolidone/polyvinyl acetate copolymer, a sulfonated polystyrene, a polyvinyl pyrrolidone/polystyrene copolymer, a polysaccharide, a xanthan, a hydrophilic cellulose derivative, a hyaluronic acid, a hydrophilic polyacrylate, a hydrophilic polymethacrylate, a DNA or analog thereof, an RNA or analog thereof, heparin, a chitosan, a polyethylene imine, a polyacrylamide, an amine-containing polymer, and combinations thereof; or

the miscible polymer blend comprises two hydrophobic polyurethanes as a cap coat in a reservoir system.

76. A method of forming a tunable active agent delivery system comprising:

providing a first miscible polymer having a solubility parameter;

selecting a second polymer to be miscible with the first polymer to form a miscible polymer blend that controls the delivery of the active agent having a molecular weight of no greater than about 1200 g/mol; wherein the difference between the solubility parameter of the active agent and at least one solubility parameter of each of the polymers is no greater than about 10 $J^{1/2}/cm^{3/2}$, and the difference between at least one solubility parameter of each of the polymers is no greater than about 5 $J^{1/2}/cm^{3/2}$; and

combining the miscible polymers in amounts sufficient to form a miscible polymer blend capable of delivering the active agent at a predetermined release rate; and

combining at least one active agent with the miscible polymer blend such that the miscible polymer blend controls the delivery of the active agent at the predetermined release rate;

wherein:

the miscible polymer blend comprises at least one hydrophobic cellulose derivative and at least one miscible polyvinyl homopolymer or copolymer selected from the group consisting of a polyvinyl alkylate homopolymer or copolymer, a polyvinyl alkyl ether homopolymer or copolymer, a polyvinyl acetal homopolymer or copolymer, and combinations thereof; or

the miscible polymer blend comprises a polyurethane and a second miscible polymer that is not a hydrophobic cellulose ester; wherein the second miscible polymer is selected from the group consisting of a polycarbonate, a polysulfone, a polyurethane, a polyphenylene oxide, a polyimide, a polyamide, a polyester, a polyether, a polyketone, a polyepoxide, a styrene-acrylonitrile copolymer, a poly(vinyl ester), a poly(vinyl ether), a polyacrylate, a poly(methyl acrylate), a polymethacrylate, a poly(methyl methacrylate), and combinations thereof; or

the miscible polymer blend comprises a poly(ethylene-co-(meth)acrylate) and a second miscible polymer not including poly(ethylene vinyl acetate); wherein the second miscible polymer is selected from the group consisting of a poly(vinyl alkylate) homopolymer or copolymer, a poly(vinyl alkyl ether) homopolymer or copolymer, a poly(vinyl acetal) homopolymer or copolymer, a poly(alkyl and/or aryl methacrylate) homopolymer or copolymer, a poly(alkyl and/or aryl acrylate) homopolymer or copolymer, and combinations thereof; or

the miscible polymer blend comprises miscible polymers selected from the group consisting of polyacrylonitriles, cyanoacrylates, methacrylonitriles, hydrophilic cellulosics, and combinations thereof; or

the miscible polymer blend comprises a polyurethane and at least one miscible hydrophilic polymer selected from the group consisting of a polyurethane, a polyvinyl alcohol, a poly(alkylene ether), a polyvinyl pyridine, a polyvinyl pyrrolidone, a polyacrylonitrile, a polyacrylamide, a polyvinyl pyrrolidone/polyvinyl acetate copolymer, a sulfonated polystyrene, a polyvinyl pyrrolidone/polystyrene copolymer, a polysaccharide, a xanthan, a hydrophilic cellulose derivative, a hyaluronic acid, a hydrophilic polyacrylate, a hydrophilic polymethacrylate, a DNA or analog thereof, an RNA or analog thereof, heparin, a chitosan, a polyethylene imine, a polyacrylamide, an amine-containing polymer, and combinations thereof; or

the miscible polymer blend comprises two hydrophobic polyurethanes as a cap coat in a reservoir system.

77. A method of forming a tunable active agent delivery system comprising:

providing a first miscible polymer having a solubility parameter;

selecting a second polymer to be miscible with the first polymer to form a miscible polymer blend that controls the delivery of the active agent having a molecular weight of greater than about 1200 g/mol; wherein the difference between the solubility parameter of the active agent and at least one solubility parameter of each of the polymers is no greater than about 10

$J^{1/2}/cm^{3/2}$, and the difference between at least one solubility parameter of each of the polymers is no greater than about 5 $J^{1/2}/cm^{3/2}$; and

combining the first polymer and the second polymer in amounts sufficient to form a miscible polymer blend capable of delivering the active agent at a predetermined release rate; and

combining at least one active agent with the miscible polymer blend such that the miscible polymer blend controls the delivery of the active agent at the predetermined release rate;

wherein:

the miscible polymer blend comprises at least one hydrophobic cellulose derivative and at least one miscible polymer selected from the group consisting of polyethylene, polypropylene, polyisobutylene, polystyrene, poly(vinyl chloride), poly(vinyl bromide), poly(vinylidene chloride), poly(tetrafluoroethylene), poly(chloro trifluoroethylene), poly(vinyl alcohol), poly(vinyl acetate), poly(vinyl propionate), poly(methyl acylate), poly(ethyl acrylate), poly(propyl acrylate), poly(butyl acrylate), poly(isobutyl acrylate), poly(2,2,3,3,4,4,4-heptafluorobutyl acrylate), poly(methyl methacrylate), poly(ethyl methacrylate), poly(butyl methacrylate), poly(isobutyl methacrylate), poly(tert-butyl methacrylate), poly(benzyl methacrylate), poly(ethoxyethyl methacrylate), polyacrylonitrile, polymethacrylonitrile, poly(alpha-cyanomethyl acrylate), polybutadiene, polyisoprene, polychloroprene, polyformaldehyde, poly(tetramethylene oxide), poly(propylene oxide), polyepichlorohydrin, poly(ethylene sulphide), poly(styrene sulphide), poly(ethylene terephthalate), poly(8-aminocaprylic

acid), poly(hexamethylene adipamide), polyurethane hard segment (MDI + BDO), poly(bisphenyl A carbonate), cellulose acetate butyrate, phenoxy, poly(vinyl pyrrolidone), poly(vinyl pyrrolidone)-co-poly(vinyl acetate), poly(ethylene oxide), and combinations thereof; or

the miscible polymer blend comprises at least one hydrophilic polymer and a second miscible polymer that is hydrophilic or hydrophobic; wherein the hydrophilic polymer is selected from the group consisting of a polyurethane, a polyvinyl alcohol, a poly(alkylene ether), a polyvinyl pyridine, a polyvinyl pyrrolidone, a polyacrylonitrile, a polyacrylamide, a polyvinyl pyrrolidone/polyvinyl acetate copolymer, a sulfonated polystyrene, a polyvinyl pyrrolidone/polystyrene copolymer, a polysaccharide, a xanthan, a hydrophilic cellulose derivative, a hyaluronic acid, a hydrophilic polyacrylate, a hydrophilic polymethacrylate, a DNA or analog thereof, an RNA or analog thereof, heparin, a chitosan, a polyethylene imine, a polyacrylamide, an amine-containing polymer, and combinations thereof; and the hydrophobic polymer is selected from the group consisting of a polyurethane, a polycarbonate, a polysulfone, a polyphenylene osied, a polyimide, a polyamide, a polyester, a polyether, a polyketone, a polyepoxide, a styrene-acrylonitrile copolymer, a polyvinyl alkylate, a polyvinyl alkyl ether, a polyvinyl acetal, a hydrophobic cellulose derivative, and combinations thereof.

78. A method for tuning the delivery of an active agent to a subject, the method comprising:

providing an active agent delivery system comprising an active agent having a molecular weight greater than about 1200 g/mol and a miscible polymer blend, comprising:

providing a first miscible polymer having a solubility parameter;

selecting a second polymer to be miscible with the first polymer and having solubility parameter;

combining the first polymer and the second polymer to form a miscible polymer blend that controls the delivery of the active agent; wherein the difference between the solubility parameter of the active agent and at least one solubility parameter of each of the polymers is no greater than about 10 $J^{1/2}/cm^{3/2}$, and the difference between at least one solubility parameter of each of the polymers is no greater than about 5 $J^{1/2}/cm^{3/2}$; and

combining the miscible polymers and an active agent in amounts sufficient to form the active agent delivery system comprising a miscible polymer blend capable of delivering an active agent at a predetermined release rate; and

contacting the active agent delivery system with a bodily fluid, organ, or tissue of a subject to deliver the active agent at the predetermined release rate;

wherein:

the miscible polymer blend comprises at least one hydrophobic cellulose derivative and at least one miscible polymer selected from the group consisting of polyethylene, polypropylene, polyisobutylene, polystyrene, poly(vinyl chloride), poly(vinyl bromide), poly(vinylidene chloride), poly(tetrafluoroethylene), poly(chloro trifluoroethylene), poly(vinyl alcohol), poly(vinyl acetate), poly(vinyl propionate), poly(methyl acylate), poly(ethyl acrylate), poly(propyl acrylate), poly(butyl acrylate), poly(isobutyl acrylate), poly(2,2,3,3,4,4,4-heptafluorobutyl acrylate), poly(methyl methacrylate), poly(ethyl methacrylate), poly(butyl methacrylate), poly(isobutyl

methacrylate), poly(tert-butyl methacrylate), poly(benzyl methacrylate), poly(ethoxyethyl methacrylate), polyacrylonitrile, polymethacrylonitrile, poly(alpha-cyanomethyl acrylate), polybutadiene, polyisoprene, polychloroprene, polyformaldehyde, poly(tetramethylene oxide), poly(propylene oxide), polyepichlorohydrin, poly(ethylene sulphide), poly(styrene sulphide), poly(ethylene terephthalate), poly(8-aminocaprylic acid), poly(hexamethylene adipamide), polyurethane hard segment (MDI + BDO), poly(bisphenyl A carbonate), cellulose acetate butyrate, phenoxy, poly(vinyl pyrrolidone), poly(vinyl pyrrolidone)-co-poly(vinyl acetate), poly(ethylene oxide), and combinations thereof; or

the miscible polymer blend comprises at least one hydrophilic polymer and a second miscible polymer that is hydrophilic or hydrophobic; wherein the hydrophilic polymer is selected from the group consisting of a polyurethane, a polyvinyl alcohol, a poly(alkylene ether), a polyvinyl pyridine, a polyvinyl pyrrolidone, a polyacrylonitrile, a polyacrylamide, a polyvinyl pyrrolidone/polyvinyl acetate copolymer, a sulfonated polystyrene, a polyvinyl pyrrolidone/polystyrene copolymer, a polysaccharide, a xanthan, a hydrophilic cellulose derivative, a hyaluronic acid, a hydrophilic polyacrylate, a hydrophilic polymethacrylate, a DNA or analog thereof, an RNA or analog thereof, heparin, a chitosan, a polyethylene imine, a polyacrylamide, an amine-containing polymer, and combinations thereof; and the hydrophobic polymer is selected from the group consisting of a polyurethane, a polycarbonate, a polysulfone, a polyphenylene osied, a polyimide, a polyamide, a polyester, a polyether, a polyketone, a polyepoxide, a

styrene-acrylonitrile copolymer, a polyvinyl alkylate, a polyvinyl alkyl ether, a polyvinyl acetal, a hydrophobic cellulose derivative, and combinations thereof.

EVIDENCE APPENDIX

Serial No. 10/640,853

Docket No. 134.01930101

1. Sirhan et al. (U.S. 2002/0082679 A1) (entered into the record by citation within the non-final Office Action mailed November 5, 2007).

2. Perez (U.S. 2004/0012118 A1) (entered into the record by citation in an Information Disclosure Statement mailed by the Applicants on November 1, 2006).

3. Hossainy et al. (U.S. Patent No. 6,153,252) (entered into the record by citation within the non-final Office Action mailed March 30, 2006).

4. Whitbourne et al. (U.S. Patent No. 6,110,483) (entered into the record by citation in an Information Disclosure Statement mailed by the Applicants on December 16, 2003).

5. Non-Final Office Action, mailed December 6, 2006.

6. Final Office Action, mailed April 11, 2007.

7. Non-Final Office Action, mailed November 5, 2007.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/640,853	08/13/2003	Randall V. Sparer	P-10998.00	9178

26813 7590 12/06/2006

MUETING, RAASCH & GEBHARDT, P.A.
P.O. BOX 581415
MINNEAPOLIS, MN 55458

EXAMINER	
ROGERS, JAMES WILLIAM	
ART UNIT	PAPER NUMBER
1618	

DATE MAILED: 12/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/640,853	SPARER ET AL.	
	Examiner	Art Unit	
	James W. Rogers, Ph.D.	1618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 November 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18 and 20-78* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18 and 20-78* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *11/01/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/01/2006 has been entered.

Amendments entered

The amendments to the claims and new claims 75-78 have been entered. The amendment to the specification filed 11/01/2006 was also entered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-18 and 20-78 are rejected under 35 U.S.C. 102(b) as being unpatentable by Hossainy et al. (US 6,153,252).

Hossainy teaches a coating for stents and a method for forming the coated stent having a film forming biocompatible polymer coating in which different polymers may be used for different layers (polyurethanes, polyamides, polyesters, polymethacrylates polyolefins, ethylene methyl methacrylate copolymers various hydrophilic celluloses and

many other hydrophobic and hydrophilic polymers were specifically listed) in which the top coat (either a film or matrix) can be used to deliver therapeutic and pharmaceutical agents (including fluorouracil which has a MW less then 1200 g/mol and several hydrophobic and hydrophilic active agents are listed). See col 1 lin 6-9, col 2 lin 9-19, col 4 lin 15-col 5 lin 38, col 7 lin 5-11, lin 56-col 8 lin 35, col 9 lin 20-25, fig. 6 and 7. See col 7 lin 18-55. Regarding the limitation that the miscible polymer blend initially provides a barrier to permeation is, this limitation is met, since Hossainy detailed the use of a top coating to delay release of the pharmaceutical agent. Regarding the limitations that at least one polymer has a higher diffusivity and one lower then the target diffusivity is met since the target diffusivity is determined by the preselected time for delivery and the preselected critical dimension of the polymer which is taught by Hossainy; it is inherent that the diffusivity for the polymer films (also their TG diffusivities) and the active agent would be the same as the applicants since the polymeric films and the active agents are the same. See col 7 lin 18-55, fig. 6 and 7. Regarding the limitation on swellability for the polymer blend which is no more than 10% by volume, this limitation is met, because Hossainy teaches the use of polymeric films within the scope of the applicants claims therefore it is inherent that since the polymer films are the same they will have the same swellability by volume, this appears to be just a new property or a measurement of a known property of an old combination and is not a patentable distinction. Regarding the selection of the first and second polymer and active ingredient based upon their solubility parameters being no greater than a certain range such as 10,5 or 3 $J^{1/2}cm^{3/2}$, this appears to be just a new property or a measurement of a known property of an old

combination and is not a patentable distinction. Regarding claims 71-74 it is inherent that a stent, being an implantable device, would deliver an active agent to a bodily fluid, organ or tissue of a subject when a polymer film containing an active agent coats that stent. Regarding the new limitations in claims 75-78 on a method of tuning the delivery of an active agent and a miscible polymer blend by selecting at least two miscible polymers to form a miscible polymer blend that controls the delivery of the active agent, this is met by Hossainy who teaches a method to make the same polymer blend as claimed by applicant and detailed the use of a top coating to delay release of the pharmaceutical agent, therefore the polymer blend controls the delivery of the active agent in the same way as applicants newly entered claims. Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case or either anticipation or obviousness has been established, Thus the claiming of a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable.

Claims 1-18 and 20-78 are rejected under 35 U.S.C. 102(b) as being unpatentable by Whitbourne et al. (US 6,110,483).

Whitbourne teaches a coating for biomedical devices (including stents) and the method to make the coatings in which the coating is a blend of a stabilizing polymer and an active agent comprised of a hydrophilic polymer (the blends can include the following: polyurethanes, acrylic polymers, methacrylic polymers, vinyl acetal polymers, polyethers, PVP, epoxy polymers, several hydrophilic celluloses and numerous other

stabilizing and hydrophilic polymers/copolymers) the coating also comprises a bio-active agent contained within (including thymol which has a MW less then 1200 g/mol, several hydrophobic and hydrophilic active agents are also listed). See col 1 lin 5-12, lin 65-col 2 lin 24, lin 31-38, lin 43-47, col 3 lin 21-59, col 4 lin 13-36, col 5 lin 28, lin 41-46, col 7 lin 15-17, lin 55-56, col 9 lin 29-32, 50-54 and claim 17. Regarding the selection of the first and second polymer and active ingredient based upon their solubility parameters being no greater than a certain range such as 10,5 or 3 $J^{1/2}cm^{3/2}$, this appears to be just a new property or a measurement of a known property of an old combination and is not a patentable distinction. Regarding the limitation that "the miscible polymer blend initially provides a barrier to permeation" this limitation is met, since Whitbourne discuses a time-release effect of the active ingredient attributable to the interaction of the bioactive agents with the stabilizing polymer. See col 3 lin 56-59. Regarding the limitation that the swellability for the polymer blend is no more than 10% by volume, this limitation is met, because Whitbourne discusses the swellability of the hydrophilic polymer in the composition, while the patent discussed the swellability in terms of weight not volume it is inherent that by blending with a non-swelling polymer the blend could have swelling of no greater than 10% of its own volume, also since the polymers are the same so will be their physical properties such as swelling. See col 5 lin 1-12. Regarding the limitation that at least one polymer has a higher diffusivity and one lower then the target diffusivity, this is considered inherent by the examiner (see above). Regarding claims 71-74 it is inherent that a stent being an implantable device would deliver any active agent to a bodily fluid, organ or tissue of a subject when a polymer film containing an

active agent coats that stent. Regarding the new limitations in claims 75-78 on a method of tuning the delivery of an active agent and a miscible polymer blend by selecting at least two miscible polymers to form a miscible polymer blend that controls the delivery of the active agent, this is met by Hossainy who teaches a method to make the same polymer blend as claimed by applicant and detailed the use of a top coating to delay release of the pharmaceutical agent, therefore the polymer blend controls the delivery of the active agent in the same way as applicants newly entered claims. Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case or either anticipation or obviousness has been established, Thus the claiming of a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-18 and 20-78 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hossainy et al. (US 6,153,252).

Hossainy is disclosed above. The Hossainy patent is silent on the solubility parameter value of the biocompatible polymeric films and the active agent. Even though Hossainy is silent on the solubility parameters of the polymers and active agents and using the parameters to select the polymers and actives that would be miscible with each other, it is still obvious that since Hossainy encompasses many of the same polymers and active agents as applicants currently claimed invention it meets these limitations since obviously the same compounds will have the same solubility parameters. Besides this argument it is further evidenced by the disclosure within Perez (US 2004/0012118 A1, submitted in applicants IDS) that it was already understood in the art to use solubility parameters to predict if polymers would be miscible, See [0030] and [0081]. Thus it was already known in the art to select polymers that would be miscible with one another based upon their solubility parameters and it would also be obvious to the skilled artisan that any active ingredients incorporated within the miscible polymer blends should also be relatively close in solubility to at one of the polymers in order to form a uniform miscible blend. [W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. The normal desire of scientists or artisans to improve upon

what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages.

Claims 1-18 and 20-78 are rejected under 35 U.S.C. 103(a) as being unpatentable over Whitbourne et al. (US 6,110,483).

Whitbourne is disclosed above. The Whitbourne patent is silent on the solubility parameter value of the biocompatible polymeric films and the active agent. Even though Whitbourne is silent on the solubility parameters of the polymers and active agents and using the parameters to select the polymers and actives that would be miscible with each other, it is still obvious that since Whitbourne encompasses many of the same polymers and active agents as applicants currently claimed invention it meets these limitations since obviously the same compounds will have the same solubility parameters. Besides this argument it is further evidenced by the disclosure within Perez (US 2004/0012118 A1, submitted in applicants IDS) that it was already understood in the art to use solubility parameters to predict if polymers would be miscible, See [0030] and [0081]. Thus it was already known in the art to select polymers that would be miscible with one another based upon their solubility parameters and it would also be obvious to the skilled artisan that any active ingredients incorporated within the miscible polymer blends should also be relatively close in solubility to at one of the polymers in order to form a uniform miscible blend. [W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. The normal desire of scientists or artisans to improve upon

what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages.

Double Patenting

Claims 1,3-9,20,22-27,29-32,34-61,63-69,71,73 and 74-78 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-57 of copending Application No. 10/640,714. Although the conflicting claims are not identical, they are not patentably distinct from each other because both claim an active drug delivery system comprising a miscible polymer blend of a hydrophobic cellulose derivative and a miscible polyvinyl homopolymer or copolymer selected from polyvinyl alkylate homopolymer or copolymer, a polyvinyl alkyl ether homopolymer or copolymer, a polyvinyl acetal homopolymer or copolymer, and combinations thereof, the difference between the solubility parameters of the two polymers is no greater than 5 $J^{1/2}cm^{3/2}$. Regarding the limitations that the swellability for the polymer blend is no more than 10% by volume, the limitation of the difference of Tg between the two polymers and the limitation that at least one polymer has a higher diffusivity and one lower then the target diffusivity, both of these properties are considered to be met by the examiner since the compositions are the same they will inherently have the same properties.

Claims 1,3-9,20,22-27,29-32,34-61,63-69,71,73 and 74-78 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-51 of copending Application No. 10/640,702. Although the conflicting claims are not identical, they are not patentably distinct from each other

because both claim an active drug delivery system comprising a miscible polymer blend of a poly(ethylene-co-(meth)acrylate) and a second miscible poly(vinyl alkylate), a poly(vinyl alkyl ether), a poly(vinyl acetal), a poly(alkyl and/or aryl methacrylate) or a poly(alkyl and/or aryl acrylate); and combinations thereof, the difference between the solubility parameters of the two polymers is no greater than 5 $J^{1/2}cm^{3/2}$. Regarding the limitations that the swellability for the polymer blend is no more than 10% by volume, the limitation of the difference of Tg between the two polymers and the limitation that at least one polymer has a higher diffusivity and one lower then the target diffusivity, both of these properties are considered to be met by the examiner since the compositions are the same they will inherently have the same properties.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

No claims are allowed. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James W. Rogers whose telephone number is (571) 272-7838. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Hartley can be reached on (571) 272-0616. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MICHAEL G. HARTLEY
SUPERVISORY PATENT EXAMINER

UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/640,853	08/13/2003	Randall V. Sparer	P-10998.00	9178

26813 7590 04/11/2007
MUETING, RAASCH & GEBHARDT, P.A.
P.O. BOX 581415
MINNEAPOLIS, MN 55458

EXAMINER	
ROGERS, JAMES WILLIAM	
ART UNIT	**PAPER NUMBER**
1618	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/11/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/640,853	SPARER ET AL.	
	Examiner	Art Unit	
	James W. Rogers, Ph.D.	1618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 March 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) *1-18 and 20-78* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18 and 20-78* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Amendment entered

The amendments to the claims filed 03/06/2007 have been entered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-18 and 20-78 are rejected under 35 U.S.C. 102(b) as being unpatentable by Hossainy et al. (US 6,153,252), for the reasons set forth in the previous office action dated 12/06/2006.

Applicants arguments/remarks filed 03/06/2007 have been fully considered but are not persuasive.

Applicants asserts that Hossainy fails explicitly or inherently teach each and every element of the amended claims which recite a method that includes some variation of selecting a second polymer to be miscible with a first polymer provided elsewhere in the claim in order to form a miscible blend particularly suited for tunable delivery of an active agent.

The relevance of this assertion is unclear. Clearly Hossainy teaches a method of forming a coating for a stent, the coating can be comprised of the same polymer blend as applicants claimed invention, since the polymers are the same it is inherent they will

have the same solubility parameters and the difference between the solubility parameters of the polymers will also be the same. It appears as though applicants are claiming an unknown property (the difference between the two polymers solubility parameters) of an old combination. Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case or either anticipation or obviousness has been established, Thus the claiming of a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable. In re Best, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977).

Claims 1-18 and 20-78 are rejected under 35 U.S.C. 102(b) as being unpatentable by Whitbourne et al. (US 6,110,483), for the reasons set forth in the previous office action dated 12/06/2006.

Applicants asserts that Whitbourne fails explicitly or inherently teach each and every element of the amended claims which recite a method that includes some variation of selecting a second polymer to be miscible with a first polymer provided elsewhere in the claim in order to form a miscible blend particularly suited for tunable delivery of an active agent.

The relevance of this assertion is unclear. Clearly Whitbourne teaches a method of forming a coating for biomedical devices, the coating can be comprised of the same polymer blend as applicants claimed invention, since the polymers are the same it is inherent they will have the same solubility parameters and the difference between the

solubility parameters of the polymers will also be the same. It appears as though applicants are claiming an unknown property (the difference between the two polymers solubility parameters) of an old combination. Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case or either anticipation or obviousness has been established, Thus the claiming of a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable. In re Best, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-18 and 20-78 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hossainy et al. (US 6,153,252), for the reasons set forth in the previous office action dated 12/06/2006.

Applicants arguments/remarks filed 03/06/2007 have been fully considered but are not persuasive.

Applicants asserts that Hossainy fails to set forth each and every element of the amended claims which recite a method that includes some variation of selecting a second polymer to be miscible with a first polymer provided elsewhere in the claim in order to form a miscible blend particularly suited for tunable delivery of an active agent.

The relevance of this assertion is unclear. Clearly Hossainy discloses a method of forming a coating for a stent, the coating can be comprised of the same polymer blend as applicants claimed invention, since the polymers are the same it is obvious they will have the same solubility parameters and the difference between the solubility parameters of the polymers will also be the same. It appears as though applicants are claiming an unknown property (the difference between the two polymers solubility parameters) of an old combination. Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case or either anticipation or obviousness has been established, Thus the claiming of a new use, new function or unknown property which is inherently present in the prior art does not necessarily make

the claim patentable. In re Best, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977). Furthermore, as noted in the previous office action the Perez reference showed evidence that it was already understood in the art to use solubility parameters to predict if polymers would be miscible with each other. Thus it was already known in the art to select polymers that would be miscible with one another based upon their solubility parameters.

Claims 1-18 and 20-78 are rejected under 35 U.S.C. 103(a) as being unpatentable over Whitbourne et al. (US 6,110,483), for the reasons set forth in the previous office action dated 12/06/2006.

Applicants asserts that Whitbourne fails to set forth each and every element of the amended claims which recite a method that includes some variation of selecting a second polymer to be miscible with a first polymer provided elsewhere in the claim in order to form a miscible blend particularly suited for tunable delivery of an active agent.

The relevance of this assertion is unclear. Clearly Whitbourne discloses a method of forming a coating for a biomedical devices, the coating can be comprised of the same polymer blend as applicants claimed invention, since the polymers are the same it is obvious they will have the same solubility parameters and the difference between the solubility parameters of the polymers will also be the same. It appears as though applicants are claiming an unknown property (the difference between the two polymers solubility parameters) of an old combination. Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case or either

anticipation or obviousness has been established, Thus the claiming of a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable. In re Best, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977). Furthermore, as noted in the previous office action the Perez reference showed evidence that it was already understood in the art to use solubility parameters to predict if polymers would be miscible with each other. Thus it was already known in the art to select polymers that would be miscible with one another based upon their solubility parameters.

Double Patenting

Applicants asserted in their arguments/remarks filed 03/06/2007 that upon indication of otherwise allowable subject matter and in the event the rejection is maintained applicants will provide an appropriate response.

Since applicants have not addressed the double patenting rejection in the previous office action and the claims as amended do not contain allowable subject matter the rejection for double patenting of claims 1,3-9,20,22-27,29-32,34-61,63-69,71,73 and 74-78 over claims 1-57 of copending Application No. 10/640,714 set forth in the previous office action dated 12/06/2006 still stands.

Conclusion

No claims are allowed at this time.

Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James W. Rogers, Ph.D. whose telephone number is (571) 272-7838. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Hartley can be reached on (571) 271-0616. The fax phone number for the organization where this application or proceeding is assigned is 572-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MICHAEL G. HARTLEY
SUPERVISORY PATENT EXAMINER

UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/640,853	08/13/2003	Randall V. Sparer	P-10998.00	9178

26813 7590 11/05/2007

MUETING, RAASCH & GEBHARDT, P.A.
P.O. BOX 581415
MINNEAPOLIS, MN 55458

EXAMINER	
ROGERS, JAMES WILLIAM	
ART UNIT	**PAPER NUMBER**
1618	
MAIL DATE	**DELIVERY MODE**
11/05/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.	Applicant(s)	
10/640,853	SPARER ET AL.	
Examiner	**Art Unit**	
James W. Rogers, Ph.D.	1618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 September 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18 and 20-78* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18 and 20-78* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *09/14/2007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 09/14/2007 has been entered.

Amendment entered

The amendments to the claims filed 09/14/2007 have been entered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-18 and 20-78 are rejected under 35 U.S.C. 102(e) as being anticipated by Sirhan et al. (US 2002/0082679 A1).

Sirhan teaches a luminal prosthesis that can be in the form of a stent, the stent can further contain a rate-controlling element formed from polymers including cellulose acetate butyrate (CAB), polyethylene vinyl acetate (PEVA), polyurethane,

polycarbonates, polymethylmethacrylate and the like and mixtures and combinations thereof, the rate controlling element provides for a controlled release of at least one active ingredient that can be contained within the element. See abstract, [0046]-[0050],[0053] and claims 1,18,74-76,80-82,112-118 and 126. The active ingredient included numerous therapeutics including dexamethasone, azatioprine and prednisone, all of the above active ingredients are also disclosed as active ingredients within applicants own specification. See claim 18 and [0030]. Regarding the selection of the first and second polymer and active ingredient based upon their solubility parameters being no greater than a certain range such as 10,5 or 3 $J^{1/2}cm^{3/2}$, Sirhan teaches the mixtures of the same polymers and active ingredients as applicants claimed invention, therefore it is inherent that the same polymers and actives will have the same solubility parameters. It appears as though applicants are claiming a new and/or undiscovered property of an old composition. Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case or either anticipation or obviousness has been established, Thus the claiming of a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable. Regarding the limitation that the miscible polymer blend initially provides a barrier to permeation, this limitation is met, since Sirhan teaches the use of the same polymers in a mixture with the active agent contained within that the polymer it will provide the same barrier to permeation since the polymers are the same then their release properties will inherently be the same. Regarding the limitations that at least

one polymer has a higher diffusivity and one lower then the target diffusivity, this limitation is met since it is inherent that the diffusivity for the polymer films (also their TG diffusivities) and the active agent would be the same as the applicants since the polymeric films and the active agents are the same. Regarding the limitation on swellability for the polymer blend which is no more than 10% by volume, this limitation is met, because Sirhan teaches the use of polymeric films within the scope of the applicants claims therefore it is inherent that since the polymer films are the same they will have the same swellability by volume. Regarding claims 71-74 it is inherent that a stent, being an implantable device, would deliver an active agent to a bodily fluid, organ or tissue of a subject when a polymer film containing an active agent coats that stent. Regarding the limitations in claims 75-78 on a method of tuning the delivery of an active agent and a miscible polymer blend by selecting at least two miscible polymers to form a miscible polymer blend that controls the delivery of the active agent, this is met by Sirhan who teaches a method to make the same polymer blend as claimed by applicant, the blend incorporated a bioactive agent, therefore the polymer blend would control the delivery of the bioactive agent in the same way as applicants claims since the same composition will inherently have the same properties.

Claims 1-18 and 20-78 are rejected under 35 U.S.C. 102(b) as being unpatentable by Hossainy et al. (US 6,153,252).

Hossainy teaches a coating for stents and a method for forming the coated stent having a film forming biocompatible polymer coating in which different polymers may be used for different layers (polyurethanes, polyamides, polyesters, polymethacrylates

polyolefins, ethylene methyl methacrylate copolymers various hydrophilic celluloses and many other hydrophobic and hydrophilic polymers were specifically listed) in which the top coat (either a film or matrix) can be used to deliver therapeutic and pharmaceutical agents (including fluorouracil which is disclosed as an active ingredient within applicants own specification). See col 1 lin 6-9, col 2 lin 9-19, col 4 lin 15-col 5 lin 38, col 7 lin 5-11, lin 56-col 8 lin 35, col 9 lin 20-25, fig. 6 and 7. See col 7 lin 18-55. Regarding the selection of the first and second polymer and active ingredient based upon their solubility parameters being no greater than a certain range such as 10,5 or 3 $J^{1/2}cm^{3/2}$, Hossainy teaches the mixtures of the same polymers and active ingredients as applicants claimed invention, therefore it is inherent that the same polymers and actives will have the same solubility parameters. It appears as though applicants are claiming a new and/or undiscovered property of an old composition. Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case or either anticipation or obviousness has been established, Thus the claiming of a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable. Regarding the limitation that the miscible polymer blend initially provides a barrier to permeation, this limitation is met, since Hossainy detailed the use of a top coating to delay release of the pharmaceutical agent. Regarding the limitations that at least one polymer has a higher diffusivity and one lower then the target diffusivity is met since the target diffusivity is determined by the preselected time for delivery and the preselected critical dimension of the polymer which

is taught by Hossainy; it is inherent that the diffusivity for the polymer films (also their TG diffusivities) and the active agent would be the same as the applicants since the polymeric films and the active agents are the same. See col 7 lin 18-55, fig. 6 and 7. Regarding the limitation on swellability for the polymer blend which is no more than 10% by volume, this limitation is met, because Hossainy teaches the use of polymeric films within the scope of the applicants claims therefore it is inherent that since the polymer films are the same they will have the same swellability by volume. Regarding claims 71-74 it is inherent that a stent, being an implantable device, would deliver an active agent to a bodily fluid, organ or tissue of a subject when a polymer film containing an active agent coats that stent. Regarding the limitations in claims 75-78 on a method of tuning the delivery of an active agent and a miscible polymer blend by selecting at least two miscible polymers to form a miscible polymer blend that controls the delivery of the active agent, this is met by Hossainy who teaches a method to make the same polymer blend as claimed by applicant and detailed the use of a top coating to delay release of the pharmaceutical agent, therefore the polymer blend controls the delivery of the active agent in the same way as applicants newly entered claims.

Claims 1-18 and 20-78 are rejected under 35 U.S.C. 102(b) as being unpatentable by Whitbourne et al. (US 6,110,483).

Whitbourne teaches a coating for biomedical devices (including stents) and the method to make the coatings in which the coating is a blend of a stabilizing polymer and an active agent comprised of a hydrophilic polymer (the blends can include the following: polyurethanes, acrylic polymers, methacrylic polymers, vinyl acetal polymers,

polyethers, PVP, epoxy polymers, several hydrophilic celluloses and numerous other stabilizing and hydrophilic polymers/copolymers) the coating also comprises a bio-active agent contained within (including thymol which is disclosed as an active ingredient within applicants own specification). See col 1 lin 5-12, lin 65-col 2 lin 24, lin 31-38, lin 43-47, col 3 lin 21-59, col 4 lin 13-36, col 5 lin 28, lin 41-46, col 7 lin 15-17, lin 55-56, col 9 lin 29-32, 50-54 and claim 17. Regarding the selection of the first and second polymer and active ingredient based upon their solubility parameters being no greater than a certain range such as 10,5 or 3 $J^{1/2}cm^{3/2}$, Sirhan teaches the mixtures of the same polymers and active ingredients as applicants claimed invention, therefore it is inherent that the same polymers and actives will have the same solubility parameters. It appears as though applicants are claiming a new and/or undiscovered property of an old composition. Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case or either anticipation or obviousness has been established, Thus the claiming of a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable. Regarding the limitation that "the miscible polymer blend initially provides a barrier to permeation" this limitation is met, since Whitbourne discuses a time-release effect of the active ingredient attributable to the interaction of the bioactive agents with the stabilizing polymer. See col 3 lin 56-59. Regarding the limitation that the swellability for the polymer blend is no more than 10% by volume, this limitation is met, because Whitbourne discusses the swellability of the hydrophilic polymer in the composition,

while the patent discussed the swellability in terms of weight not volume it is inherent that by blending with a non-swelling polymer the blend could have swelling of no greater than 10% of its own volume, also since the polymers are the same so will be their physical properties such as swelling. See col 5 lin 1-12. Regarding the limitation that at least one polymer has a higher diffusivity and one lower then the target diffusivity, this is considered inherent by the examiner (see above). Regarding claims 71-74 it is inherent that a stent being an implantable device would deliver any active agent to a bodily fluid, organ or tissue of a subject when a polymer film containing an active agent coats that stent. Regarding the limitations in claims 75-78 on a method of tuning the delivery of an active agent and a miscible polymer blend by selecting at least two miscible polymers to form a miscible polymer blend that controls the delivery of the active agent, this is met by Hossainy who teaches a method to make the same polymer blend as claimed by applicant and detailed the use of a top coating to delay release of the pharmaceutical agent, therefore the polymer blend controls the delivery of the active agent in the same way as applicants newly entered claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-18 and 20-78 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sirhan et al. (US 2002/0082679 A1).

Sirhan is disclosed above. The Sirhan patent is silent on the solubility parameter value of the biocompatible polymeric films and the active agent. Even though Sirhan is silent on the solubility parameters of the polymers and active agents and using the parameters to select the polymers and actives that would be miscible with each other, it is still obvious that since Sirhan encompasses many of the same polymers and active agents as applicants currently claimed invention it meets these limitations since obviously the same compounds will have the same solubility parameters. Besides this argument it is further evidenced by the disclosure within Perez (US 2004/0012118 A1, submitted in applicants IDS) that it was already understood in the art to use solubility parameters to predict if polymers would be miscible, See [0030] and [0081] within Perez. Thus it was already known in the art to select polymers that would be miscible with one another based upon their solubility parameters and it would also be obvious to the skilled artisan that any active ingredients incorporated within the miscible polymer blends should also be relatively close in solubility to at one of the polymers in order to

form a uniform miscible blend. [W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages.

Claims 1-18 and 20-78 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hossainy et al. (US 6,153,252).

Hossainy is disclosed above. The Hossainy patent is silent on the solubility parameter value of the biocompatible polymeric films and the active agent. Even though Hossainy is silent on the solubility parameters of the polymers and active agents and using the parameters to select the polymers and actives that would be miscible with each other, it is still obvious that since Hossainy encompasses many of the same polymers and active agents as applicants currently claimed invention it meets these limitations since obviously the same compounds will have the same solubility parameters. Besides this argument it is further evidenced by the disclosure within Perez (US 2004/0012118 A1, submitted in applicants IDS) that it was already understood in the art to use solubility parameters to predict if polymers would be miscible, See [0030] and [0081]. Thus it was already known in the art to select polymers that would be miscible with one another based upon their solubility parameters and it would also be obvious to the skilled artisan that any active ingredients incorporated within the miscible polymer blends should also be relatively close in solubility to at one of the polymers in order to form a uniform miscible blend. [W]here the general conditions of a claim are

disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages.

Claims 1-18 and 20-78 are rejected under 35 U.S.C. 103(a) as being unpatentable over Whitbourne et al. (US 6,110,483).

Whitbourne is disclosed above. The Whitbourne patent is silent on the solubility parameter value of the biocompatible polymeric films and the active agent. Even though Whitbourne is silent on the solubility parameters of the polymers and active agents and using the parameters to select the polymers and actives that would be miscible with each other, it is still obvious that since Whitbourne encompasses many of the same polymers and active agents as applicants currently claimed invention it meets these limitations since obviously the same compounds will have the same solubility parameters. Besides this argument it is further evidenced by the disclosure within Perez (US 2004/0012118 A1, submitted in applicants IDS) that it was already understood in the art to use solubility parameters to predict if polymers would be miscible, See [0030] and [0081]. Thus it was already known in the art to select polymers that would be miscible with one another based upon their solubility parameters and it would also be obvious to the skilled artisan that any active ingredients incorporated within the miscible polymer blends should also be relatively close in solubility to at one of the polymers in order to form a uniform miscible blend. [W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges

by routine experimentation. The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages.

Response to Arguments

Applicant's arguments filed 09/14/2007 have been fully considered but they are not persuasive.

Applicants asserts that Hossainy and Whitbourne fails explicitly or inherently teach each and every element of the amended claims which recite a method that includes some variation of selecting a second polymer to be miscible with a first polymer provided elsewhere in the claim in order to form a miscible blend particularly suited for tunable delivery of an active agent. Applicants surmise that the examiner is not considering the fact that applicant's claims are drawn to methods by which the coatings and miscible polymer blends are formed. Thus applicants assert there is a conscience and deliberate method in the selection process of choosing the polymers.

The relevance of these assertions is unclear. It appears as though applicants are claiming an abstract idea, applicants claims are drawn to a method of producing an active agent delivery system. Applicant's claims do not actually recite selecting two polymers based on their solubility parameters, rather the claims recite that a first miscible polymer is provided and then selecting another second polymer and combining the two, forming a miscible polymer blend. The recitation of the solubility parameter does not actually mention that the two polymers are selected based on their solubility parameter it is merely recites a physical property of the two polymers. The selection of

the second polymer could be made by numerous means known to those of ordinary skill in the art. Therefore in order to anticipate applicants claimed invention the examiner only has to meet a method of making an active delivery agent system with applicants claimed ingredients. The solubility parameters as stated above are in inherent property of the ingredients, therefore their recitation, as a claim limitation does not preclude any reference that discloses those same ingredients. Also applicant's argument that the claimed invention is in undiscovered property is also not found persuasive. As disclosed above within the Perez reference it was already understood in the art at the time of applicants claimed invention to use solubility parameters to predict if polymers would be miscible with each other. Essentially it appears as though applicants are claiming a method to produce a known material by methods already well known in the art to be common scientific knowledge. As cited above it appears as though applicants are claiming a method to produce a material based upon the ingredients properties which may have been undiscovered or unknown. Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case or either anticipation or obviousness has been established, Thus the claiming of a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable.

Conclusion

No claims are allowed. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James W. Rogers, Ph.D.

whose telephone number is (571) 272-7838. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Hartley can be reached on (571) 272-0616. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MICHAEL G. HARTLEY
SUPERVISORY PATENT EXAMINER

Notice of References Cited

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U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2002/0082679	06-2002	Sirhan et al.	623/1.15
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
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NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
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*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

RELATED PROCEEDINGS APPENDIX

Serial No. 10/640,853

Docket No. 134.01930101

None.